CHAPTER 8. REFERENCES

Abbasi SA, Nipaney PC, Soni R. 1989. Environmental status of cobalt and its microdetermination with 7-nitroso-8-hyrdoxyquinoline-5-sulfonic acid in waters, aquatic weeds and animal tissues. Anal Lett 22(1):225-235. https://doi.org/10.1080/00032718908051196.

Abdel-Daim MM, Khalil SR, Awad A, et al. 2020. Ethanolic extract of Moringa oleifera leaves influences NF-κB signaling pathway to restore kidney tissue from cobalt-mediated oxidative injury and inflammation in rats. Nutrients 12(4):1031. https://doi.org/10.3390/nu12041031.

Abraham JL, Hunt A. 1995. Environmental contamination by cobalt in the vicinity of a cemented tungsten carbide tool grinding plant. Environ Res 69(1):67-74. https://doi.org/10.1006/enrs.1995.1026.

Afridi HI, Kazi TG, Kazi NG, et al. 2009. Evaluation of arsenic, cobalt, copper and manganese in biological samples of steel mill workers by electrothermal atomic absorption spectrometry. Toxicol Ind Health 25(1):59-69. https://doi.org/10.1177/0748233709103036.

AIHA. 2016. Cobalt. In: 2016 ERPG/WEEL handbook. American Industrial Hygiene Association, 22-31.

Ajibade TO, Oyagbemi AA, Omobowale TO, et al. 2017. Quercetin and vitamin C mitigate cobalt chloride-induced hypertension through reduction in oxidative stress and nuclear factor kappa beta (NF-Kb) expression in experimental rat model. Biol Trace Elem Res 175(2):347-359. https://doi.org/10.1007/s12011-016-0773-5.

Akinrinde AS, Adebiyi OE. 2019. Neuroprotection by luteolin and gallic acid against cobalt chloride-induced behavioural, morphological and neurochemical alterations in Wistar rats. Neurotoxicology 74:252-263. https://doi.org/10.1016/j.neuro.2019.07.005.

Akinrinde AS, Omobowale O, Oyagbemi A, et al. 2016a. Protective effects of kolaviron and gallic acid against cobalt-chloride-induced cardiorenal dysfunction via suppression of oxidative stress and activation of the ERK signaling pathway. Can J Physiol Pharmacol 94(12):1276-1284. https://doi.org/10.1139/cjpp-2016-0197.

Akinrinde AS, Oyagbemi AA, Omobowale TO, et al. 2016b. Alterations in blood pressure, antioxidant status and caspase 8 expression in cobalt chloride-induced cardio-renal dysfunction are reversed by Ocimum gratissimum and gallic acid in Wistar rats. J Trace Elem Med Biol 36:27-37. https://doi.org/10.1016/j.jtemb.2016.03.015.

Akinrinde AS, Oyagbemi AA, Omobowale TO, et al. 2016c. Cobalt chloride-induced hepatic and intestinal damage in rats: Protection by ethyl acetate and chloroform fractions of Ocimum gratissimum. Toxicol Int 23(1):38-48. https://doi.org/10.22506/ti/2016/v23/i1/146668.

Akita K, Okamura H, Yoshida K, et al. 2007. Cobalt chloride induces apoptosis and zinc chloride suppresses cobalt-induced apoptosis by Bcl-2 expression in human submandibular gland HSG cells. Int J Oncol 31(4):923-929.

Al-Abcha A, Wang L, Reilly MJ, et al. 2021. Work-related asthma in cobalt-exposed workers. J Asthma 58(8):1032-1041. https://doi.org/10.1080/02770903.2020.1759090.

Alarifi S, Ali D, Suliman Y AO, et al. 2013. Oxidative stress contributes to cobalt oxide nanoparticles-induced cytotoxicity and DNA damage in human hepatocarcinoma cells. Int J Nanomedicine 8:189-199. https://doi.org/10.2147/IJN.S37924.

Alaux-Negrel G, Beucaire C, Michard G, et al. 1993. Trace-metal behaviour in natural granitic waters. J Contam Hydrol 13:309-325. https://doi.org/10.1016/0169-7722(93)90068-4.

Albals D, Al-Momani IF, Issa R, et al. 2021. Multi-element determination of essential and toxic metals in green and roasted coffee beans: A comparative study among different origins using ICP-MS. Sci Prog 104(2):368504211026162. https://doi.org/10.1177/00368504211026162.

Albrecht A. 2003. Validating riverine transport and speciation models using nuclear reactor-derived radiocobalt. J Environ Radioact 66:295-307. https://doi.org/10.1016/S0265-931X(02)00133-9.

Alexa T, Luca A, Bohotin C, et al. 2015. The effect of cobalt chloride preconditioning on paclitaxel-induced peripheral neuropathy. Rev Med Chir Soc Med Nat Iasi 119(2):447-453.

8. REFERENCES

Alexander CS. 1969. Cobalt and the heart. Ann Intern Med 70(2):411-413. https://doi.org/10.7326/0003-4819-70-2-411.

Alexander CS. 1972. Cobalt-beer cardiomyopathy. A clinical and pathologic study of twenty-eight cases. Am J Med 53(4):395-417. https://doi.org/10.1016/0002-9343(72)90136-2.

Alexandersson R. 1988. Blood and urinary concentrations as estimators of cobalt exposure. Arch Environ Health 43(4):299-303. https://doi.org/10.1080/00039896.1988.10545953.

Ali AA. 2019. Evaluation of some biological, biochemical, and hematological aspects in male albino rats after acute exposure to the nano-structured oxides of nickel and cobalt. Environ Sci Pollut Res Int 26(17):17407-17417. https://doi.org/10.1007/s11356-019-05093-2.

Alinaghi F, Bennike NH, Egeberg A, et al. 2019. Prevalence of contact allergy in the general population: A systematic review and meta-analysis. Contact Dermatitis 80(2):77-85. https://doi.org/10.1111/cod.13119.

Alinaghi F, Friis UF, Deleuran MG, et al. 2020. Exposure analysis using x-ray fluorescence device and a cobalt spot test in four patients with cobalt allergy. Contact Dermatitis 82(1):67-69. https://doi.org/10.1111/cod.13394.

Alinovi R, Goldoni M, Pinelli S, et al. 2015. Oxidative and pro-inflammatory effects of cobalt and titanium oxide nanoparticles on aortic and venous endothelial cells. Toxicol In Vitro 29(3):426-437. https://doi.org/10.1016/j.tiv.2014.12.007.

Alinovi R, Goldoni M, Pinelli S, et al. 2017. Titanium dioxide aggregating nanoparticles induce autophagy and under-expression of microRNA 21 and 30a in A549 cell line: A comparative study with cobalt(II, III) oxide nanoparticles. Toxicol In Vitro 42:76-85. https://doi.org/10.1016/j.tiv.2017.04.007.

Amacher DE, Paillet SC. 1980. Induction of trifluorothymidine-resistant mutants by metal ions in L5178Y/TK+/- cells. Mutat Res 78(3):279-288. https://doi.org/10.1016/0165-1218(80)90110-x.

Amiard J, Amiard-Triquet C. 1979. Distribution of cobalt 60 in a mollusc, a crustacean and a freshwater teleost: Variations as a function of the source of pollution and during elimination. Environ Pollut 20(3):199-213. https://doi.org/10.1016/0013-9327(79)90005-3.

Amundsen CE, Hanssen JE, Semb A, et al. 1992. Long-range atmospheric transport of trace elements to southern Norway. Atmos Environ 26A(7):1309-1324. https://doi.org/10.1016/0960-1686(92)90391-W.

Anaissi F, Horsth D, Dalastra J, et al. 2020. Design, synthesis, and application of colored cobalt pigments (pink, blue, green). J Braz Chem Soc 31(11):2265-2273. https://doi.org/10.21577/0103-5053.20200078.

Anavekar NS, Nixon R. 2006. Occupational allergic contact dermatitis to cobalt octoate included as an accelerator in a polyester resin. Australas J Dermatol 47(2):143-144. https://doi.org/10.1111/j.1440-0960.2006.00251.x.

Andersen O. 1983. Effects of coal combustion products and metal compounds on sister chromatid exchange (SCE) in a macrophagelike cell line. Environ Health Perspect 47:239-253. https://doi.org/10.1289/ehp.8347239.

Andersen ME, Krishnan K. 1994. Relating in vitro to in vivo exposures with physiologically based tissue dosimetry and tissue response models. In: Salem H, ed. Animal test alternatives: Refinement, reduction, replacement. New York, NY: Marcel Dekker, Inc., 9-25.

Anderson MB, Pedigo NG, Katz RP, et al. 1992. Histopathology of testes from mice chronically treated with cobalt. Reprod Toxicol 6(1):41-50. https://doi.org/10.1016/0890-6238(92)90019-p.

Anderson MB, Lepak K, Farinas V, et al. 1993. Protective action of zinc against cobalt-induced testicular damage in the mouse. Reprod Toxicol 7(1):49-54. https://doi.org/10.1016/0890-6238(93)90009-v.

Andersson E, Knutsson A, Hagberg S, et al. 2006. Incidence of asthma among workers exposed to sulphur dioxide and other irritant gases. Eur Respir J 27(4):720-725. https://doi.org/10.1183/09031936.06.00034305.

8. REFERENCES

Andersson L, Hedbrant A, Bryngelsson IL, et al. 2020. Respiratory health and inflammatory markers-exposure to cobalt in the Swedish hard metal industry. J Occup Environ Med 62(10):820-829. https://doi.org/10.1097/jom.0000000000001952.

Andersson L, Hedbrant A, Persson A, et al. 2021. Inflammatory and coagulatory markers and exposure to different size fractions of particle mass, number and surface area air concentrations in the Swedish hard metal industry, in particular to cobalt. Biomarkers 26(6):557-569. https://doi.org/10.1080/1354750x.2021.1941260.

Andre S, Metivier H, Masse R. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles- Part III: Lung clearance of inhaled cobalt oxide particles in baboons. J Aerosol Sci 20(2):205-217. https://doi.org/10.1016/0021-8502(89)90042-6.

Apostoli P, Porru S, Alessio L. 1994. Urinary cobalt excretion in short time occupational exposure to cobalt powders. Sci Total Environ 150(1-3):129-132. https://doi.org/10.1016/0048-9697(94)90139-2.

Apostoli P, Giusti S, Bartoli D, et al. 1998. Multiple exposure to arsenic, antimony, and other elements in art glass manufacturing. Am J Ind Med 34(1):65-72. https://doi.org/10.1002/(sici)1097-0274(199807)34:1<65::aid-ajim9>3.0.co;2-p.

Arimoto R, Duce RA, Ray BJ, et al. 1985. Atmospheric trace elements at Enewetak Atoll: 2. Transport to the ocean by wet and dry deposition. J Geophys Res 90(D1):2391-2408. https://doi.org/10.1029/JD090iD01p02391.

Arlauskas A, Baker RS, Bonin AM, et al. 1985. Mutagenicity of metal ions in bacteria. Environ Res 36(2):379-388. https://doi.org/10.1016/0013-9351(85)90032-5.

Arslan S, Aksan S, Ucar R, et al. 2015. Contact dermatitis to cobalt chloride with an unusual mechanism. Prosthet Orthot Int 39(5):419-421. https://doi.org/10.1177/0309364614534293.

Ashrap P, Watkins DJ, Mukherjee B, et al. 2020. Predictors of urinary and blood metal(loid) concentrations among pregnant women in Northern Puerto Rico. Environ Res 183:109178. https://doi.org/10.1016/j.envres.2020.109178.

ATSDR. 1989. Decision guide for identifying substance- specific data needs related to toxicological profiles; Notice. Fed Regist 54(174):37617-37634.

ATSDR. 1995. Public health assessment: Blackbird Mine, Cobalt, Lemhi County, Idaho. Atlanta, GA: Agency of Toxic Substances and Disease Registry.

ATSDR. 1998. Toxicological profile for sulfur dioxide. Atlanta, GA: Agency for Toxic Substances and Disease Registry. PB99122020. https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB99122020.xhtml. December 6, 2023.

ATSDR. 1999. Toxicological profile for ionizing radiation. Atlanta, GA: Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services. PB99163388. https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB99163388.xhtml. December 6, 2023.

ATSDR. 2018. Draft guidance for the preparation of toxicological profiles Atlanta, GA: Agency for Toxic Substances and Disease Registry. https://www.atsdr.cdc.gov/toxprofiles/guidance/profile_development_guidance.pdf. December 7, 2023.

ATSDR. 2001. Summary report for the ATSDR Soil-Pica Workshop June 2000 Atlanta, Georgia. Agency for Toxic Substances and Disease Registry. https://www.atsdr.cdc.gov/child/pdf/summary-report-ATSDR-soil-pica-workshop-june-2000-508.pdf. June 24, 2024.

ATSDR. 2022. Full SPL data. Substance priority list (SPL) resource page. Agency for Toxic Substances and Disease Registry. http://www.atsdr.cdc.gov/SPL/resources. June 8, 2023.

ATSDR. 2023. Sanders2015 HLCs used in SHOWER Model v3 and PHAST. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

Awoyemi OV, Okotie UJ, Oyagbemi AA, et al. 2017. Cobalt chloride exposure dose-dependently induced hepatotoxicity through enhancement of cyclooxygenase-2 (COX-2)/B-cell associated

protein X (BAX) signaling and genotoxicity in Wistar rats. Environ Toxicol 32(7):1899-1907. https://doi.org/10.1002/tox.22412.

Ayala-Fierro F, Firriolo JM, Carter DE. 1999. Disposition, toxicity, and intestinal absorption of cobaltous chloride in male Fischer 344 rats. J Toxicol Environ Health A 56(8):571-591. https://doi.org/10.1080/00984109909350178.

Badsha KS, Goldspink CR. 1988. Heavy metal levels in three species of fish in Tjeukemeer, a Dutch polder lake. Chemosphere 17(2):459-463. https://doi.org/10.1016/0045-6535(88)90235-4.

Baes CF, Sharp RD. 1983. A proposal for estimation of soil leaching and leaching constants for use in assessment models. J Environ Qual 12(1):17-28. https://doi.org/10.2134/jeq1983.00472425001200010003x.

Bailey MR, Roy M. 1994. Annexe E. Clearance of particles from the respiratory tract. Ann ICRP 24(1-3):301-413. https://doi.org/10.1016/0146-6453(94)90043-4.

Bailey MR, Kreyling WG, Andre S, et al. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles- Part I: Objectives and summary of results. J Aerosol Sci 20(2):169-188. https://doi.org/10.1016/0021-8502(89)90042-6.

Bailey MR, Ansoborlo E, Guilmette RA, et al. 2007. Updating the ICRP human respiratory tract model. Radiat Prot Dosimetry 127(1-4):31-34. https://doi.org/10.1093/rpd/ncm249.

Baker DH, Czarnecki-Maulden GL. 1987. Pharmacological role of cysteine in ameliorating or exacerbating mineral toxicities. J Nutr 117(6):1003-1010. https://doi.org/10.1093/jn/117.6.1003.

Banza CL, Nawrot TS, Haufroid V, et al. 2009. High human exposure to cobalt and other metals in Katanga, a mining area of the Democratic Republic of Congo. Environ Res 109(6):745-752. https://doi.org/10.1016/j.envres.2009.04.012.

Banza Lubaba Nkulu C, Casas L, Haufroid V, et al. 2018. Sustainability of artisanal mining of cobalt in DR Congo. Nat Sustain 1(9):495-504. https://doi.org/10.1038/s41893-018-0139-4.

Barany E, Bergdahl IA, Bratteby LE, et al. 2005. Iron status influences trace element levels in human blood and serum. Environ Res 98(2):215-223. https://doi.org/10.1016/j.envres.2004.09.010.

Barceloux DG. 1999. Cobalt. J Toxicol Clin Toxicol 37(2):201-206. https://doi.org/10.1081/clt-100102420.

Bargagli R. 2000. Trace metals in Antarctica related to climate change and increasing human impact. Rev Environ Contam Toxicol 166:129-173.

Bargagli R, Barghigiani C, Siegel BZ, et al. 1991. Trace metal anomalies in surface soils and vegetation on two active island volcanoes: Stromboli and Volcano (Italy). Sci Total Environ 102:209-222. https://doi.org/10.1016/0048-9697(91)90315-6.

Barlas N. 1999. A pilot study of heavy metal concentration in various environments and fishes in the Upper Sakarya River Basin, Turkey. Environ Toxicol 14(3):367-373. https://doi.org/10.1002/(sici)1522-7278(199907)14:3<367::Aid-tox11>3.0.Co;2-9.

Barnaby CF, Smith T, Thompson BD. 1968. Dosimetry of the radioisotopes of cobalt. Phys Med Biol 13(3):421-433. https://doi.org/10.1088/0031-9155/13/3/309.

Barnes DG, Dourson M. 1988. Reference dose (RfD): Description and use in health risk assessments. Regul Toxicol Pharmacol 8:471-486. https://doi.org/10.1016/0273-2300(88)90047-5.

Barnes JE, Kanapilly GM, Newton GJ. 1976. Cobalt-60 oxide aerosols: methods of production and short-term retention and distribution kinetics in the beagle dog. Health Phys 30(5):391-398. https://doi.org/10.1097/00004032-197605000-00003.

Basketter DA, Angelini G, Ingber A, et al. 2003. Nickel, chromium and cobalt in consumer products: revisiting safe levels in the new millennium. Contact Dermatitis 49(1):1-7. https://doi.org/10.1111/j.0105-1873.2003.00149.x.

Bastian S, Busch W, Kuhnel D, et al. 2009. Toxicity of tungsten carbide and cobalt-doped tungsten carbide nanoparticles in mammalian cells in vitro. Environ Health Perspect 117(4):530-536. https://doi.org/10.1289/ehp.0800121.

8. REFERENCES

Battistini B, Petrucci F, De Angelis I, et al. 2020. Quantitative analysis of metals and metal-based nano- and submicron-particles in tattoo inks. Chemosphere 245:125667. https://doi.org/10.1016/j.chemosphere.2019.125667.

Baumgardt B, Jackwerth E, Otto H, et al. 1986. Trace analysis to determine heavy metal load in lung tissue. A contribution to substantiation of occupational hazards. Int Arch Occup Environ Health 58(1):27-34. https://doi.org/10.1007/BF00378537.

Behl M, Stout MD, Herbert RA, et al. 2015. Comparative toxicity and carcinogenicity of soluble and insoluble cobalt compounds. Toxicology 333:195-205. https://doi.org/10.1016/j.tox.2015.04.008.

Beijer K, Jernelov A. 1986. Sources, transport and transformation of metals in the environment. In: Friberg L, Nordberg GF, Vouk V, eds. Handbook on the toxicology of metals. 2nd ed. Amsterdam, Netherlands: Elsevier Science Publishers B.V., 68-84.

Beleznay E, Osvay M. 1994. Long-term clearance of accidentally inhaled ^{60}Co aerosols in humans. Health Phys 66(4):392-399. https://doi.org/10.1097/00004032-199404000-00003.

Bencko V, Wagner V, Wagnerova M, et al. 1983. Immuno-biochemical findings in groups of individuals occupationally and non-occupationally exposed to emissions containing nickel and cobalt. J Hyg Epidemiol Microbiol Immunol 27(4):387-394.

Benes P, Jurak M, Cernik M. 1989. Factors affecting interaction of radiocobalt with river sediments. II. Composition and concentration of sediment, temperature. J Radioanal Nucl Chem 132(2):225-239. https://doi.org/10.1007/BF02136082.

Berniyanti T, Palupi R, Kriswandini IL, et al. 2020. Suitability of MDA, 8-OHdG and wild-type p53 as genotoxic biomarkers in metal (Co, Ni and Cr) exposed dental technicians: a cross-sectional study. BMC Oral Health 20(1):65. https://doi.org/10.1186/s12903-020-1049-1.

Beskid M. 1963. The effect of administration of cobalt chloride on the pancreas in the guinea-pig. Folia Histochem Cytochem (Krakow) 1:95-102.

Biego GH, Joyeux M, Hartemann P, et al. 1998. Daily intake of essential minerals and metallic micropollutants from foods in France. Sci Total Environ 217(1-2):27-36. https://doi.org/10.1016/s0048-9697(98)00160-0.

Bocca B, Forte G, Petrucci F, et al. 2007. Levels of nickel and other potentially allergenic metals in Ni-tested commercial body creams. J Pharm Biomed Anal 44(5):1197-1202. https://doi.org/10.1016/j.jpba.2007.04.031.

Bocca B, Ruggieri F, Pino A, et al. 2019. Human biomonitoring to evaluate exposure to toxic and essential trace elements during pregnancy. Part A. Concentrations in maternal blood, urine and cord blood. Environ Res 177:108599. https://doi.org/10.1016/j.envres.2019.108599.

Bocca B, Ruggieri F, Pino A, et al. 2020. Human biomonitoring to evaluate exposure to toxic and essential trace elements during pregnancy. Part B: Predictors of exposure. Environ Res 182:109108. https://doi.org/10.1016/j.envres.2019.109108.

Bonefeld CM, Nielsen MM, Vennegaard MT, et al. 2015. Nickel acts as an adjuvant during cobalt sensitization. Exp Dermatol 24(3):229-231. https://doi.org/10.1111/exd.12634.

Bonenfant JL, Auger C, Miller G, et al. 1969. Quebec beer-drinkers' myocardosis: pathological aspects. Ann N Y Acad Sci 156(1):577-582. https://doi.org/10.1111/j.1749-6632.1969.tb16752.x.

Bourg WJ, Nation JR, Clark DE. 1985. The effects of chronic cobalt exposure on passive-avoidance performance in the adult rat. Bull Psychonomic Soc 23(6):527-530. https://doi.org/10.3758/BF03329874.

Bowie EA, Hurley PJ. 1975. Cobalt chloride in the treatment of refractory anaemia in patients undergoing long-term haemodialysis. Aust N Z J Med 5(4):306-314. https://doi.org/10.1111/j.1445-5994.1975.tb03263.x.

Brandao MH, Gontijo B. 2012. Contact sensitivity to metals (chromium, cobalt and nickel) in childhood. An Bras Dermatol 87(2):269-276. https://doi.org/10.1590/s0365-05962012000200012.

Bregnbak D, Zachariae C, Thyssen JP. 2015a. Occupational exposure to metallic cobalt in a baker. Contact Dermatitis 72(2):118-119. https://doi.org/10.1111/cod.12321.

Bregnbak D, Thyssen JP, Zachariae C, et al. 2015b. Association between cobalt allergy and dermatitis caused by leather articles-a questionnaire study. Contact Dermatitis 72(2):106-114. https://doi.org/10.1111/cod.12319.

Bregnbak D, Opstrup MS, Jellesen MS, et al. 2017. Allergic contact dermatitis caused by cobalt in leather - clinical cases. Contact Dermatitis 76(6):366-368. https://doi.org/10.1111/cod.12721.

Briani C, Cacciavillani M, Nicolli A, et al. 2015. 'Snake eyes' MRI sign: possible role of cobalt toxicity? J Neurol 262(2):471-472. https://doi.org/10.1007/s00415-014-7580-8.

Brock T, Stopford W. 2003. Bioaccessibility of metals in human health risk assessment: evaluating risk from exposure to cobalt compounds. J Environ Monit 5(4):71N-76N. https://doi.org/10.1039/b307520f.

Broding HC, Michalke B, Goen T, et al. 2009. Comparison between exhaled breath condensate analysis as a marker for cobalt and tungsten exposure and biomonitoring in workers of a hard metal alloy processing plant. Int Arch Occup Environ Health 82(5):565-573. https://doi.org/10.1007/s00420-008-0390-5.

Brooks SC, Herman JS, Hornberger GM, et al. 1998. Biodegradation of cobalt-citrate complexes: Implications for cobalt mobility in groundwater. J Contam Hydrol 32:99-115. https://doi.org/10.1016/S0169-7722(97)00083-1.

Brown DM, Johnston HJ, Gaiser B, et al. 2018. A cross-species and model comparison of the acute toxicity of nanoparticles used in the pigment and ink industries. NanoImpact 11:20-32. https://doi.org/10.1016/j.impact.2018.02.001.

Browning E. 1969. Cobalt. In: Toxicity of industrial metals. 2nd ed. New York, NY: Appleton-Century-Crofts, 132.

Brugmann L. 1988. Some peculiarities of the trace-metal distribution in Baltic waters and sediments. Mar Chem 23(3-4):425-440. https://doi.org/10.1016/0304-4203(88)90109-0.

Brune D, Kjaerheim A, Paulsen G, et al. 1980. Pulmonary deposition following inhalation of chromium-cobalt grinding dust in rats and distribution in other tissues. Scand J Dent Res 88(6):543-551. https://doi.org/10.1111/j.1600-0722.1980.tb01265.x.

Brusseau ML, Zachara JM. 1993. Transport of Co2+ in a physically and chemically heterogeneous porous medium. Environ Sci Technol 27(9):1937-1939. https://doi.org/10.1021/es00046a026.

Bryan SE, Bright JE. 1973. Serum protein responses elicited by iron, cobalt and mercury. Toxicol Appl Pharmacol 26(1):109-117. https://doi.org/10.1016/0041-008x(73)90091-4.

Bucher JR, Elwell MR, Thompson MB, et al. 1990. Inhalation toxicity studies of cobalt sulfate in F344/N rats and B6C3F1 mice. Fundam Appl Toxicol 15(2):357-372. https://doi.org/10.1016/0272-0590(90)90061-n.

Bucher JR, Hailey JR, Roycroft JR, et al. 1999. Inhalation toxicity and carcinogenicity studies of cobalt sulfate. Toxicol Sci 49:56-67. https://doi.org/10.1093/toxsci/49.1.56.

Bucher JR, Hailey JR, Roycroft JR, et al. 2022. Correction to: Inhalation toxicity and carcinogenicity studies of cobalt sulfate. Toxicol Sci 188(2):276. https://doi.org/10.1093/toxsci/kfac063.

Buchter B, Davidoff B, Amacher MC, et al. 1989. Correlation of Freundlich Kd and n retention parameters with soils and elements. Soil Science 148(5):370-379.

Burba P, Rocha J, Klockow D. 1994. Labile complexes of trace metals in aquatic humic substances: Investigations by means of an ion exchange-based flow procedure. Fresenius J Anal Chem 349:800-807. https://doi.org/10.1007/BF00323109.

Burger J, Gochfeld M. 1988. Metals in tern eggs in a New Jersey estuary: A decade of change. Environ Monit Assess 11(2):127-135. https://doi.org/10.1007/BF00401725.

Burke DH, Brooks JC, Ryan RP, et al. 1978. p-Chloroamphetamine antagonism of cobaltous chloride-induced hypothermia in mice. Eur J Pharmacol 60:241-243. https://doi.org/10.1016/0014-2999(79)90224-3.

Burzlaff A, Creutzenberg O, Schaudien D, et al. 2022a. A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 4: Effects from a 28-day inhalation toxicity study with tricobalt

tetraoxide in rats. Regul Toxicol Pharmacol 130:105129. https://doi.org/10.1016/j.yrtph.2022.105129.

Burzlaff A, Creutzenberg O, Schaudien D, et al. 2022b. Supplemental material: A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 4: Effects from a 28-day inhalation toxicity study with tricobalt tetraoxide in rats. Regul Toxicol Pharmacol 130 https://doi.org/10.1016/j.yrtph.2022.105129.

Byczkowski JZ, Gearhart JM, Fisher JW. 1994. "Occupational" exposure of infants to toxic chemicals via breast milk. Nutrition 10(1):43-48.

Cahill JL, Andersen KE. 2010. Occupational cobalt-allergic contact dermatitis resulting from polyester resin. Contact Dermatitis 63(5):292-294. https://doi.org/10.1111/j.1600-0536.2010.01781.x.

Caicedo M, Jacobs JJ, Reddy A, et al. 2008. Analysis of metal ion-induced DNA damage, apoptosis, and necrosis in human (Jurkat) T-cells demonstrates Ni2+ and V3+ are more toxic than other metals: Al3+, Be2+, Co2+, Cr3+, Cu2+, Fe3+, Mo5+, Nb5+, Zr2+. J Biomed Mater Res A 86(4):905-913. https://doi.org/10.1002/jbm.a.31789.

Camean A, Lopez-Artiguez M, Roca I, et al. 1998. Determination of cobalt, manganese, and alcohol content in beers. J Food Prot 61(1):129-131. https://doi.org/10.4315/0362-028x-61.1.129.

Camner P, Boman A, Johansson A, et al. 1993. Inhalation of cobalt by sensitised guinea pigs: effects on the lungs. Br J Ind Med 50(8):753-757. https://doi.org/10.1136/oem.50.8.753.

Cao S, Duan X, Zhao X, et al. 2014. Health risks from the exposure of children to As, Se, Pb and other heavy metals near the largest coking plant in China. Sci Total Environ 472:1001-1009. https://doi.org/10.1016/j.scitotenv.2013.11.124.

Capomazza C, Botta A. 1991. Cobalt chloride induces micronuclei in human lymphocytes. Med Sci Res 19:219-220.

Carvalho FP. 1987. Comparative uptake from sea water and tissue distribution of ^{60}Co in marine mollusks. Health Phys 53(1):73-81. https://doi.org/10.1097/00004032-198707000-00008.

CDC. 2017. National health and nutrition examination survey. 2015-2016 Data documentation, codebook, and frequencies. Chromium & cobalt (CRCO_I). Centers for Disease Control and Prevention. https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/CRCO_I.htm. June 8, 2021.

CDC. 2018. National health and nutrition examination survey. 2015-2016 Data documentation, codebook, and frequencies. Metals - urine (UM_I). Centers for Disease Control and Prevention. https://wwwn.cdc.gov/Nchs/Nhanes/2015-2016/UM_I.htm. June 8, 2021.

CDC. 2022. National report on human exposure to environmental chemicals. Updated March 2022. Atlanta, GA: Centers for Disease Control and Prevention. https://www.cdc.gov/exposurereport/index.html. October 13, 2022.

CDC. 2023. Blood cobalt (2015 - 2018). Centers for Disease Control and Prevention. https://www.cdc.gov/exposurereport/report/pdf/cgroup54_LBXBCO_2011-p.pdf. December 6, 2023.

Chamberlain JL. 1961. Thyroid enlargement probably induced by cobalt: A report of 3 cases. J Pediatr 59(1):81-86. https://doi.org/10.1016/s0022-3476(61)80213-8.

Chen F, Khan ZI, Zafar A, et al. 2021. Evaluation of toxicity potential of cobalt in wheat irrigated with wastewater: health risk implications for public. Environ Sci Pollut Res Int 28(17):21119-21131. https://doi.org/10.1007/s11356-020-11815-8.

Chen H, Chai M, Cheng J, et al. 2022. Occurrence and health implications of heavy metals in preschool children's clothing manufactured in four Asian regions. Ecotoxicol Environ Saf 245:114121. https://doi.org/10.1016/j.ecoenv.2022.114121.

Cheong SH, Choi YW, Choi HY, et al. 2014. Nickel and cobalt release from jewellery and metal clothing items in Korea. Contact Dermatitis 70(1):11-18. https://doi.org/10.1111/cod.12141.

Chester R, Berry AS, Murphy KJT. 1991. The distributions of particulate atmospheric trace metals and mineral aerosols over the Indian Ocean. Mar Chem 34:261-290. https://doi.org/10.1016/0304-4203(91)90007-J.

Chetty KN, Subba Rao DS, Drummond L, et al. 1979. Cobalt induced changes in immune response and adenosine triphosphatase activities in rats. J Environ Sci Health B 14(5):525-544. https://doi.org/10.1080/03601237909372148.

Cheyns K, Banza Lubaba Nkulu C, Ngombe LK, et al. 2014. Pathways of human exposure to cobalt in Katanga, a mining area of the D.R. Congo. Sci Total Environ 490:313-321. https://doi.org/10.1016/j.scitotenv.2014.05.014.

Christensen JM, Poulsen OM. 1994. A 1982-1992 surveillance programme on Danish pottery painters. Biological levels and health effects following exposure to soluble or insoluble cobalt compounds in cobalt blue dyes. Sci Total Environ 150(1-3):95-104. https://doi.org/10.1016/0048-9697(94)90134-1.

Christensen JM, Poulsen OM, Thomsen M. 1993. A short-term cross-over study on oral administration of soluble and insoluble cobalt compounds: sex differences in biological levels. Int Arch Occup Environ Health 65(4):233-240. https://doi.org/10.1007/BF00381196.

Christova T, Duridanova D, Braykova A, et al. 2001. Heme oxygenase is the main protective enzyme in rat liver upon 6-day administration of cobalt chloride. Arch Toxicol 75:445-451. https://doi.org/10.1007/s002040100253.

Christova TY, Duridanova DB, Setchenska MS. 2002. Enhanced heme oxygenase activity increases the antioxidant defense capacity of guinea pig liver upon acute cobalt chloride loading: comparison with rat liver. Comp Biochem Physiol C Toxicol Pharmacol 131(2):177-184. https://doi.org/10.1016/s1532-0456(01)00287-3.

Chu Z, Lin C, Yang K, et al. 2022. Lability, bioaccessibility, and ecological and health risks of anthropogenic toxic heavy metals in the arid calcareous soil around a nonferrous metal smelting area. Chemosphere 307(Pt 4):136200. https://doi.org/10.1016/j.chemosphere.2022.136200.

Cikrt M, Tichy M. 1981. Biliary excretion of cobalt in rats. J Hyg Epidemiol Microbiol Immunol 25(4):364-368.

Clark J. 2023. Chemistry of cobalt. LibreText Chemistry. https://chem.libretexts.org/@go/page/3721?pdf. December 6, 2023.

Clewell HJ. 1995. The application of physiologically based pharmacokinetic modeling in human health risk assessment of hazardous substances. Toxicol Lett 79(1-3):207-217. https://doi.org/10.1016/0378-4274(95)03372-r.

Clifford D, Subramonian S, Sorg TJ. 1986. Removing dissolved inorganic contaminants from water. Environ Sci Technol 20(11):1072-1080. https://doi.org/10.1021/es00153a001.

Clyne N, Lins L-E, Pehrsson SK, et al. 1988. Distribution of cobalt in myocardium, skeletal muscle and serum in exposed and unexposed rats. Trace Elem Med 5(2):52-54.

Clyne N, Hofman-Bang C, Haga Y, et al. 2001. Chronic cobalt exposure affects antioxidants and ATP production in rat myocardium. Scand J Clin Lab Invest 61(8):609-614. https://doi.org/10.1080/003655101753267964.

Coakley JP, Nagy E, Serodes J-B. 1994. Spatial and vertical trends in sediment-phase contaminants in the upper estuary of the St. Lawrence river. Estuaries 16(3B):653-669. https://doi.org/10.2307/1352802.

Coleman ME, Elder RS, Koppenaal GP. 1992. Trace metals in edible tissues of livestock and poultry. J AOAC Int 75(4):615-625. https://doi.org/10.1093/jaoac/75.4.615.

Collecchi P, Esposito M, Brera S, et al. 1986. The distribution of arsenic and cobalt in patients with laryngeal carcinoma. J Appl Toxicol 6(4):287-289. https://doi.org/10.1002/jat.2550060410.

Collier CG, Bailey MR, Hodgson A. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles-Part V: Lung clearance of inhaled cobalt oxide particles in hamsters, rats and guinea-pigs. J Aerosol Sci 20(2):233-247. https://doi.org/10.1016/0021-8502(89)90046-3.

Collier CG, Hodgson A, Gray SA, et al. 1991. The lung clearance kinetics of $^{57}Co_3O_4$ in rats of various ages. J Aerosol Sci 22(4):537-549. https://doi.org/10.1016/0021-8502(91)90009-7.

Corazza M, Baldo F, Pagnoni A, et al. 2009. Measurement of nickel, cobalt and chromium in toy make-up by atomic absorption spectroscopy. Acta Derm Venereol 89(2):130-133. https://doi.org/10.2340/00015555-0595.

Corrier DE, Mollenhauer HH, Clark DE, et al. 1985. Testicular degeneration and necrosis induced by dietary cobalt. Vet Pathol 22(6):610-616. https://doi.org/10.1177/030098588502200616.

Costa M, Heck JD, Robison SH. 1982. Selective phagocytosis of crystalline metal sulfide particles and DNA strand breaks as a mechanism for the induction of cellular transformation. Cancer Res 42:2757-2763.

Cross DP, Ramachandran G, Wattenberg EV. 2001. Mixtures of nickel and cobalt chlorides induce synergistic cytotoxic effects: implications for inhalation exposure modeling. Ann Occup Hyg 45(5):409-418.

Cyr F, Mehra MC, Mallet VN. 1987. Leaching of chemical contaminants from a municipal landfill site. Bull Environ Contam Toxicol 38(5):775-782. https://doi.org/10.1007/BF01616700.

Dabeka RW. 1989. Survey of lead, cadmium, cobalt and nickel in infant formulas and evaporated milks and estimation of dietary intakes of the elements by infants 0-12 months old. Sci Total Environ 89(3):279-289. https://doi.org/10.1016/0048-9697(89)90267-2.

Dabeka RW, McKenzie AD. 1995. Survey of lead, cadmium, fluoride, nickel, and cobalt in food composites and estimation of dietary intakes of these elements by Canadians in 1986-1988. J AOAC Int 78(4):897-909.

Daniel J, Ziaee H, Pradhan C, et al. 2010. Renal clearance of cobalt in relation to the use of metal-on-metal bearings in hip arthroplasty. J Bone Joint Surg Am 92(4):840-845. https://doi.org/10.2106/JBJS.H.01821.

Danzeisen R, Williams DL, Viegas V, et al. 2020a. Bioelution, bioavailability, and toxicity of cobalt compounds correlate. Toxicol Sci 174(2):311-325. https://doi.org/10.1093/toxsci/kfz249.

Danzeisen R, Williams DL, Viegas V, et al. 2020b. Supplemental material: Bioelution, bioavailability, and toxicity of cobalt compounds correlate. Toxicol Sci 174(2) https://doi.org/10.1093/toxsci/kfz249.

Danzeisen R, Weight D, Blakeney M, et al. 2022a. A tiered approach to investigate the inhalation toxicity of cobalt substances. Introduction: Cobalt's essential role in nature and technology. Regul Toxicol Pharmacol 130:105125. https://doi.org/10.1016/j.yrtph.2022.105125.

Danzeisen R, Jänig GR, Burzlaff A, et al. 2022b. The underlying mode of action for lung tumors in a tiered approach to the assessment of inhaled cobalt compounds. Regul Toxicol Pharmacol 130:105140. https://doi.org/10.1016/j.yrtph.2022.105140.

Dasch JM, Wolff GT. 1989. Trace inorganic species in precipitation and their potential use in source apportionment studies. Water Air Soil Pollut 43:401-412. https://doi.org/10.1007/BF00279205.

Davis JE, Fields JP. 1958. Experimental production of polycythemia in humans by administration of cobalt chloride. Proc Soc Exp Biol Med 99(2):493-495. https://doi.org/10.3181/00379727-99-24395.

Davison AG, Haslam PL, Corrin B, et al. 1983. Interstitial lung disease and asthma in hard-metal workers: bronchoalveolar lavage, ultrastructural, and analytical findings and results of bronchial provocation tests. Thorax 38(2):119-128. https://doi.org/10.1136/thx.38.2.119.

Dawson EB, Evans DR, Harris WA, et al. 2000. Seminal plasma trace metal levels in industrial workers. Biol Trace Elem Res 74(2):97-105. https://doi.org/10.1385/BTER:74:2:97.

Day GA, Virji MA, Stefaniak AB. 2009. Characterization of exposures among cemented tungsten carbide workers. Part II: Assessment of surface contamination and skin exposures to cobalt, chromium and nickel. J Expo Sci Environ Epidemiol 19(4):423-434. https://doi.org/10.1038/jes.2008.33.

De Boeck M, Lison D, Kirsch-Volders M. 1998. Evaluation of the in vitro direct and indirect genotoxic effects of cobalt compounds using the alkaline comet assay. Influence of interdonor and interexperimental variability. Carcinogenesis 19(11):2021-2029. https://doi.org/10.1093/carcin/19.11.2021.

De Boeck M, Lardau S, Buchet JP, et al. 2000. Absence of significant genotoxicity in lymphocytes and urine from workers exposed to moderate levels of cobalt-containing dust: a cross-sectional study. Environ Mol Mutagen 36(2):151-160. https://doi.org/10.1002/1098-2280(2000)36:2<151::aid-em10>3.3.co;2-m.

De Boeck M, Lombaert N, De Backer S, et al. 2003. In vitro genotoxic effects of different combinations of cobalt and metallic carbide particles. Mutagenesis 18(2):177-186. https://doi.org/10.1093/mutage/18.2.177.

De Cuyper J. 1988. Milling of cobalt ores - An overview. In: Tyroler GP, Landolt CA, eds. Extractive metallurgy of nickel and cobalt symposium. Warrendale: The Metallurgical Society, Inc., 187-210.

Dehaine Q, Tijsseling LT, Glass HJ, et al. 2021. Geometallurgy of cobalt ores: A review. Miner Eng 160:106656. https://doi.org/10.1016/j.mineng.2020.106656.

Deka NC, Sehgal AK, Chhuttani PN. 1981. Absorption and transport of radioactive ^{57}cobalt vitamin B_{12} in experimental giardiasis in rats. Indian J Med Res 74:675-679.

Demedts M, Gheysens B, Nagels J, et al. 1984. Cobalt lung in diamond polishers. Am Rev Respir Dis 130(1):130-135. https://doi.org/10.1164/arrd.1984.130.1.130.

Deng JF, Sinks T, Elliott L, et al. 1991. Charaterisation of respiratory health and exposures at a sintered permanent magnet manufacturer. Br J Ind Med 48:609-615. https://doi.org/10.1136/oem.48.9.609.

Derr R, Moelijker N, Hendriks G, et al. 2022. A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 2 b: Reactive cobalt substances induce oxidative stress in ToxTracker and activate hypoxia target genes. Regul Toxicol Pharmacol 129:105120. https://doi.org/10.1016/j.yrtph.2022.105120.

DOE. 1984. Mobility of organic complexes of nickel and cobalt in soils. Washington, DC: Department of Energy. DE83017897. PNL-4796. https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/DE83017897.xhtml. February 15, 2024.

DOE. 1988. Investigation of leaching of radionuclides and hazardous materials from low-level wastes at Oak Ridge National Laboratory. Washington, DC: U.S. Department of Energy. DE87013363. ORNL/TM-9883. https://www.osti.gov/servlets/purl/6308786. December 6, 2023.

DOE. 1996. Evaluation of cobalt mobility in soils from the Nevada test site. Reno, NV: U.S. Department of Energy. DE97001628. DOE/NV/10845-58. https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/DE97001628.xhtml. December 7, 2023.

DOE. 2018b. Protective action criteria (PAC) with AEGLs, ERPGs, & TEELs: Rev. 29A, June 2018. U.S. Department of Energy. https://edms3.energy.gov/pac/. July 6, 2022.

DOE. 2023. Notice of final determination on 2023 DOE critical materials list. July 2023. U.S. Department of Energy. https://www.federalregister.gov/documents/2023/08/04/2023-16611/notice-of-final-determination-on-2023-doe-critical-materials-list. March 15, 2023.

Dogan CE, Cebi N. 2019. Investigation of antimony, cobalt, and acetaldehyde migration into the drinking water in Turkey. Packag Technol Sci 32(5):239-246. https://doi.org/10.1002/pts.2430.

Domingo JL, Llobet JM. 1984. Treatment of acute cobalt intoxication in rats with L-methionine. Rev Esp Fisiol 40(4):443-448.

Domingo JL, Llobet JM, Corbella J. 1983. The effects of EDTA in acute cobalt intoxication in rats. Toxicol Eur Res 5(6):251-255.

Domingo JL, Llobet JM, Bernat R. 1984. A study of the effects of cobalt administered orally to rats. Arch Farmacol Toxicol 10(1):13-20.

Domingo JL, Llobet JM, Corbella J. 1985a. The effect of L-histidine on acute cobalt intoxication in rats. Food Chem Toxicol 23(1):130-131. https://doi.org/10.1016/0278-6915(85)90242-x.

Domingo JL, Paternian JL, Llobet JM, et al. 1985b. Effects of cobalt on postnatal development and late gestation in rats upon oral administration. Rev Esp Fisiol 41:293-298.

Duckham JM, Lee HA. 1976. The treatment of refractory anaemia of chronic renal failure with cobalt chloride. Q J Med 45(178):277-294. https://doi.org/10.1093/oxfordjournals.qjmed.a067463.

Eckel WP, Jacob TA. 1988. Ambient levels of 24 dissolved metals in U.S. surface and ground waters. Prepr Pap Natl Meet Am Chem Soc Div Environ Chem 28(2):371-372.

EFSA. 2009. Scientific Opinion on the use of cobalt compounds as additives in animal nutrition. EFSA J 7(12):1383. https://doi.org/10.2903/j.efsa.2009.1383.

Elbetieha A, Al-Thani AS, Al-Thani RK, et al. 2008. Effects of chronic exposure to cobalt chloride on the fertility and testes in mice. J Appl Biol Sci 2(1):1-6.

El-Masri HA, Mumtaz MM, Yushak ML. 2004. Application of physiologically-based pharmacokinetic modeling to investigate the toxicological interaction between chlorpyrifos and parathion in the rat. Environ Toxicol Pharmacol 16(1-2):57-71. https://doi.org/10.1016/j.etap.2003.10.002.

EPA. 1980. Biological monitoring of toxic trace metals: Volume 1. Biological monitoring and surveillance. Washington, DC: U.S. Environmental Protection Agency. EPA600380089. PB81103475. https://cfpub.epa.gov/si/si_public_record_Report.cfm?Lab=ORD&dirEntryId=49027. December 6, 2023.

EPA. 1994. Methods for derivation of inhalation reference concentrations and application of inhalation dosimetry. Washington, DC: U.S. Environmental Protection Agency. EPA600890066F. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=30001K4C.txt. December 7, 2023.

EPA. 1997. Method 200.10: Determination of trace elements in marine waters by on-line chelation preconcentration and inductively coupled plasma - mass spectrometry. Cincinnati, OH: U.S. Environmental Protection Agency. https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=309424. December 6, 2023.

EPA. 1998. Hazardous waste management system; identification and listing of hazardous waste; petroleum refining process wastes; land disposal restrictions for newly identified wastes; and CERCLA hazardous substance designation and reportable quantities. Fed Regist 63(151):42110-42189.

EPA. 1999. Compendium of methods for the determination of inorganic compounds in ambient air. Compendium method IO-3.3. Determination of metals in ambient particulate matter using x-ray fluorescence (XRF) spectroscopy. Cincinnati, OH: U.S. Environmental Protection Agency. EPA625R96010a. https://www.epa.gov/sites/default/files/2019-11/documents/mthd-3-3.pdf. December 6, 2023.

EPA. 2000. Drinking water standards and health advisories. Washington, DC: U.S. Environmental Protection Agency. EPA822B00001.

EPA. 2008. Provisional peer reviewed toxicity values for cobalt (CASRN 7440-48-4). Cincinnati, OH: U.S. Environmental Protection Agency. EPA690R08008F. https://cfpub.epa.gov/ncea/pprtv/documents/Cobalt.pdf. November 22, 2023.

EPA. 2009. National primary drinking water regulations. U.S. Environmental Protection Agency. EPA816F090004. https://www.epa.gov/sites/default/files/2016-06/documents/npwdr_complete_table.pdf. September 7, 2017.

EPA. 2017. The third unregulated contaminant monitoring rule (UCMR 3): Data summary, January 2017. U.S. Environmental Protection Agency. EPA815S17001. https://www.epa.gov/sites/production/files/2017-02/documents/ucmr3-data-summary-january-2017.pdf.

EPA. 2018a. 2018 Edition of the drinking water standards and health advisories. Washington, DC: U.S. Environmental Protection Agency. EPA822F18001. https://www.epa.gov/system/files/documents/2022-01/dwtable2018.pdf. June 15, 2022.

EPA. 2018b. Compiled AEGL values. U.S. Environmental Protection Agency. https://www.epa.gov/sites/production/files/2018-08/documents/compiled_aegls_update_27jul2018.pdf. April 12, 2020.

EPA. 2020. Air quality system: Cobalt. U.S. Environmental Protection Agency. https://www.epa.gov/aqs. January 10, 2021.

EPA. 2022a. IRIS assessment plan and protocol for assessing cancer risk from inhalation exposure to cobalt and cobalt compounds (scoping and problem formulation materials). Washington, DC: U.S. Environmental Protection Agency. EPA635R22248. https://ordspub.epa.gov/ords/eims/eimscomm.getfile?p_download_id=545669. December 5, 2023.

EPA. 2022b. Toxic chemical release inventory reporting forms and instructions: Revised 2021 version. U.S. Environmental Protection Agency. EPA740B22002. https://ordspub.epa.gov/ords/guideme_ext/guideme_ext/guideme/file/ry_2021_rfi.pdf. August 22, 2023.

EPA. 2023a. Applicability: Description of the primary nickel and cobalt subcategory. U.S. Environmental Protection Agency. Code of Federal Regulations. 40 CFR 421.230. https://www.govinfo.gov/content/pkg/CFR-2010-title40-vol28/pdf/CFR-2010-title40-vol28-sec421-230.pdf. December 12, 2023.

EPA. 2023b. Applicability: Description of the secondary tungsten and cobalt subcategory. U.S. Environmental Protection Agency. Code of Federal Regulations. 40 CFR 421.310. https://www.govinfo.gov/content/pkg/CFR-2011-title40-vol29/pdf/CFR-2011-title40-vol29-sec421-307.pdf. December 8, 2023.

EPA. 2023c. Applicability: Description of the nickel-cobalt forming sub-category. U.S. Environmental Protection Agency. Code of Federal Regulations. 40 CFR 471.30. https://www.govinfo.gov/content/pkg/CFR-2022-title40-vol32/pdf/CFR-2022-title40-vol32-sec471-30.pdf. December 8, 2023.

EPA. 2023d. Annual summary data: Cobalt. Air data: Air quality data collected at outdoor monitors across the US. U.S. Environmental Protection Agency. https://www.epa.gov/outdoor-air-quality-data. April 19, 2023.

EPA. 2023e. Subject: Lithium battery recycling regulatory status and frequently asked questions. Washington, DC: U.S. Environmental Protection Agency. https://rcrapublic.epa.gov/files/14957.pdf. February 12, 2024.

Erlandsson B, Ingemansson T, Mattsson S. 1983. Comparative studies of radionuclides from global fallout and local sources in ground level air and sewage sludge. Water Air Soil Pollut 20:331-346. https://doi.org/10.1007/BF00284637.

Ertuğrul H, Yalçın B, Güneş M, et al. 2020. Ameliorative effects of melatonin against nano and ionic cobalt induced genotoxicity in two in vivo Drosophila assays. Drug Chem Toxicol 43(3):279-286. https://doi.org/10.1080/01480545.2019.1585444.

Evans RD, Andrews D, Cornett RJ. 1988. Chemical fractionation and bioavailability of cobalt-60 to benthic deposit-feeders. Can J Fish Aquat Sci 45:228-235. https://doi.org/10.1139/f88-027.

Exelon. 2019. Peach Bottom Atomic Power Station units 2 and 3: Annual radiological environmental operating report Delta, PA: Peach Bottom Atomic Power Station, Exelon Generation. Report No. 76. https://www.nrc.gov/docs/ML1915/ML19154A580.pdf. May 29, 2024.

Eyrolle F, Charmasson S. 2001. Distribution of organic carbon, selected stable elements and artificial radionuclides among dissolved, colloidal and particulate phases in the Rhone River (France): Preliminary results. J Environ Radioact 55:145-155. https://doi.org/10.1016/s0265-931x(00)00188-0.

Farah SB. 1983. The in vivo effect of cobalt chloride on chromosomes. Rev Bras Genet 6(3):433-442.

Farjana SH, Huda N, Mahmud MAP. 2019. Life cycle assessment of cobalt extraction process. J Sustain Min 18(3):150-161. https://doi.org/10.1016/j.jsm.2019.03.002.

FDA. 2023a. Substances prohibited from use in human food. Subpart C - Substances generally prohibited from direct addition or use as human food. Cobaltous salts and its derivatives. Food and Drug Administration. 21 CFR 189.120. https://www.govinfo.gov/content/pkg/CFR-2023-title21-vol3/pdf/CFR-2023-title21-vol3-part189-subpartC.pdf. November 22, 2023.

FDA. 2023b. Secondary direct food additives permitted in food for human consumption. Subpart D - Specific usage additives. Boil water additives. Food and Drug Administration. 21 CFR 173.310.

https://www.govinfo.gov/content/pkg/CFR-2023-title21-vol3/pdf/CFR-2023-title21-vol3-sec173-310.pdf. November 22, 2023.

Feng MR, Rossi DT, Strenkoski C, et al. 1998. Disposition kinetics of cobalt mesoporphyrin in mouse, rat, monkey and donkey. Xenobiotica 28(4):413-426. https://doi.org/10.1080/004982598239515.

Ferdenzi P, Giaroli C, Mori P, et al. 1994. Cobalt powdersintering industry (stone cutting diamond wheels): A study of environmental-biological monitoring workplace improvement and health surveillance. Sci Total Environ 150:245-248. https://doi.org/10.1016/0048-9697(94)90160-0.

Finley BL, Monnot AD, Paustenbach DJ, et al. 2012a. Derivation of a chronic oral reference dose for cobalt. Regul Toxicol Pharmacol 64(3):491-503. https://doi.org/10.1016/j.yrtph.2012.08.022.

Finley BL, Monnot AD, Gaffney SH, et al. 2012b. Dose-response relationships for blood cobalt concentrations and health effects: a review of the literature and application of a biokinetic model. J Toxicol Environ Health B Crit Rev 15(8):493-523. https://doi.org/10.1080/10937404.2012.744287.

Finley BL, Unice KM, Kerger BD, et al. 2013. 31-day study of cobalt(II) chloride ingestion in humans: pharmacokinetics and clinical effects. J Toxicol Environ Health A 76(21):1210-1224. https://doi.org/10.1080/15287394.2013.848391.

Finney BP, Huh C-A. 1989. History of metal pollution in the Southern California bight: An update. Environ Sci Technol 23(3):294-303. https://doi.org/10.1021/es00180a005.

Firriolo JM, Ayala-Fierro F, Sipes IG, et al. 1999. Absorption and disposition of cobalt naphthenate in rats after a single oral dose. J Toxicol Environ Health A 58(6):383-395. https://doi.org/10.1080/009841099157223.

Flaten TP. 1991. A nation-wide survey of the chemical composition of drinking water in Norway. Sci Total Environ 102:35-73. https://doi.org/10.1016/0048-9697(91)90307-z.

Forbes JR, Gros P. 2003. Iron, manganese, and cobalt transport by Nramp1 (Slc11a1) and Nramp2 (Slc11a2) expressed at the plasma membrane. Blood 102(5):1884-1892. https://doi.org/10.1182/blood-2003-02-0425.

Forbes RM, Cooper AR, Mitchell HH. 1954. On the occurrence of beryllium, boron, cobalt, and mercury in human tissues. J Biol Chem 209(2):857-865.

Foster PP, Pearman I, Ramsden D. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles-Part II: Lung clearance of inhaled cobalt oxide in man. J Aerosol Sci 20(2):189-204. https://doi.org/10.1016/0021-8502(89)90043-8.

Freire BM, Gonzaga RG, Pedron T, et al. 2021. Occupational exposure to potentially toxic elements in the foundry industry: an integrated environmental and biological monitoring. Environ Sci Pollut Res Int 28(26):34630-34641. https://doi.org/10.1007/s11356-021-13099-y.

Freitas ACS, Guimaraes JRD, Gouvea VA, et al. 1988. Laboratory experiments on ^{60}Co bioaccumulation by tropical seaweeds. In: Seeliger U, de Lacerda LD, Patchineelam SR, eds. Metals in coastal environments of Latin America. Berlin, Germany: Springer-Verlag, 145-154.

Fresquez MR, Pappas RS, Watson CH. 2013. Establishment of toxic metal reference range in tobacco from US cigarettes. J Anal Toxicol 37(5):298-304. https://doi.org/10.1093/jat/bkt021.

Fuentes CA, Gallegos MV, García JR, et al. 2019. Catalytic glycolysis of poly(ethylene terephthalate) using zinc and cobalt oxides recycled from spent batteries. Waste Biomass Valor 11(9):4991-5001. https://doi.org/10.1007/s12649-019-00807-6.

Fujio T, Jyoyama Y, Yasui S, et al. 2009. Cobalt concentration in urine as an indicator of occupational exposure to low level cobalt oxide. J UOEH 31(3):243-257. https://doi.org/10.7888/juoeh.31.243.

Fukunaga M, Kurachi Y, Mizuguchi Y. 1982. Action of some metal ions on yeast chromosomes. Chem Pharm Bull 30(8):3017-3019. https://doi.org/10.1248/cpb.30.3017.

Gallorini M, Edel J, Pietra R, et al. 1994. Cobalt speciation in urine of hard metal workers. A study carried out by nuclear and radioanalytical techniques. Sci Total Environ 150(1-3):153-160. https://doi.org/10.1016/0048-9697(94)90144-9.

Gao Y, Li X, Dong J, et al. 2020. Snack foods and lead ingestion risks for school aged children: A comparative evaluation of potentially toxic metals and children's exposure response of blood lead,

copper and zinc levels. Chemosphere 261:127547. https://doi.org/10.1016/j.chemosphere.2020.127547.

Garg AN, Weginwar RG, Chutke NL. 1993. Radiochemical neutron activation analysis of Fe, Co, Zn, Sb and Se in biomedical and environmental samples. Sci Total Environ 139-140:421-430. https://doi.org/10.1016/0048-9697(93)90039-9.

Garoui M, Fetoui H, Ayadi Makni F, et al. 2011. Cobalt chloride induces hepatotoxicity in adult rats and their suckling pups. Exp Toxicol Pathol 63(1-2):9-15. https://doi.org/10.1016/j.etp.2009.09.003.

Garoui M, Troudi A, Fetoui H, et al. 2012. Propolis attenuates cobalt induced-nephrotoxicity in adult rats and their progeny. Exp Toxicol Pathol 64(7-8):837-846. https://doi.org/10.1016/j.etp.2011.03.004.

Garoui E, Ben Amara I, Driss D, et al. 2013. Effects of cobalt on membrane ATPases, oxidant, and antioxidant values in the cerebrum and cerebellum of suckling rats. Biol Trace Elem Res 154(3):387-395. https://doi.org/10.1007/s12011-013-9746-0.

Garrick MD, Singleton ST, Vargas F, et al. 2006. DMT1: which metals does it transport? Biol Res 39(1):79-85. https://doi.org/10.4067/s0716-97602006000100009.

Ge X, Yang A, Huang S, et al. 2021. Sex-specific associations of plasma metals and metal mixtures with glucose metabolism: An occupational population-based study in China. Sci Total Environ 760:143906. https://doi.org/10.1016/j.scitotenv.2020.143906.

Gennart JP, Lauwerys R. 1990. Ventilatory function of workers exposed to cobalt and diamond containing dust. Int Arch Occup Environ Health 62:333-336. https://doi.org/10.1007/BF00640843.

Gennart JP, Baleux C, Verellen-Dumoulin C, et al. 1993. Increased sister chromatid exchanges and tumor markers in workers exposed to elemental chromium-, cobalt- and nickel-containing dusts. Mutat Res 299:55-61. https://doi.org/10.1016/0165-1218(93)90119-x.

Gerhardsson L, Wester PO, Nordberg GF, et al. 1984. Chromium, cobalt and lanthanum in lung, liver and kidney tissue from deceased smelter workers. Sci Total Environ 37(2-3):233-246. https://doi.org/10.1016/0048-9697(84)90099-8.

Gerhardsson L, Brune D, Nordberg GF, et al. 1988. Multielemental assay of tissues of deceased smelter workers and controls. Sci Total Environ 74:97-110. https://doi.org/10.1016/0048-9697(88)90131-3.

Gerritse RG, Vriesema R, Dalenberg JW, et al. 1982. Effect of sewage sludge on trace element mobility in soils. J Environ Qual 11(3):359-364. https://doi.org/10.2134/jeq1982.00472425001100030007x.

Gheysens B, Auwerx J, Van den Eeckhout A, et al. 1985. Cobalt-induced bronchial asthma in diamond polishers. Chest 88(5):740-744. https://doi.org/10.1378/chest.88.5.740.

Gibbs RJ. 1994. Metals in the sediments along the Hudson River Estuary. Environ Int 20(4):507-516. https://doi.org/10.1016/0160-4120(94)90199-6.

Gibson DP, Brauninger R, Shaffi HS, et al. 1997. Induction of micronuclei in Syrian hamster embryo cells: comparison to results in the SHE cell transformation assay for National Toxicology Program test chemicals. Mutat Res 392(1-2):61-70. https://doi.org/10.1016/s0165-1218(97)00045-1.

Glahn F, Schmidt-Heck W, Zellmer S, et al. 2008. Cadmium, cobalt and lead cause stress response, cell cycle deregulation and increased steroid as well as xenobiotic metabolism in primary normal human bronchial epithelial cells which is coordinated by at least nine transcription factors. Arch Toxicol 82(8):513-524. https://doi.org/10.1007/s00204-008-0331-9.

Glooschenko WA, Capocianco J, Coburn J, et al. 1981. Geochemical distribution of trace metals and organochlorine contaminants of a Lake Ontario shoreline marsh. Water Air Soil Pollut 15:197-213. https://doi.org/10.1007/BF00161253.

Gluhcheva Y, Atanasov V, Ivanova J, et al. 2014. Chronic exposure to cobalt compounds - an in vivo study. Cent Eur J Biol 9(10):973-981. https://doi.org/10.2478/s11535-014-0334-x.

Gluhcheva Y, Pavlova E, Petrova E, et al. 2020. The impact of perinatal cobalt chloride exposure on extramedullary erythropoiesis, tissue iron levels, and transferrin receptor expression in mice. Biol Trace Elem Res 194(2):423-431. https://doi.org/10.1007/s12011-019-01790-8.

Goldner MG, Volk BW, Lazarus SS. 1952. The effect of cobaltous chloride on the blood sugar and alpha cells in the pancreatic islets of the rabbit. Metabolism 1:544-548.

Goldoni M, Catalani S, De Palma G, et al. 2004. Exhaled breath condensate as a suitable matrix to assess lung dose and effects in workers exposed to cobalt and tungsten. Environ Health Perspect 112(13):1293-1298. https://doi.org/10.1289/ehp.7108.

Golomb D, Ryan D, Eby N, et al. 1997. Atmospheric deposition of toxics onto Massachusetts Bay- I. Metals. Atmos Environ 31(9):1349-1359. https://doi.org/10.1016/S1352-2310(96)00276-2.

Goodwin DA, Meares CF. 1976. Radiolabeled antitumor agents. Semin Nucl Med 6(4):389-396. https://doi.org/10.1016/s0001-2998(76)80016-5.

Greathouse DG, Craun GF. 1978. Cardiovascular disease study - Occurrence of inorganics in household tap water and relationships to cardiovascular mortality rates. Trace Subst Environ Health 12:31-39.

Greenberg DM, Copp DH, Cuthbertson EM. 1943. Studies in mineral metabolism with the aid of artificial radioactive isotopes. VII. The distribution and excretion, particularly by way of the bile, of iron, cobalt, and manganese. J Biol Chem 147:749-756. https://doi.org/10.1016/S0021-9258(18)72374-0.

Gregersen E. 2023. Cobalt-60. In: Encyclopaedia Britannica. Encyclopaedia Britannica, Inc, online. https://www.britannica.com/science/cobalt-60. December 6, 2023.

Gregus Z, Klaassen CD. 1986. Disposition of metals in rats: A comparative study of fecal, urinary, and biliary excretion and tissue distribution of eighteen metals. Toxicol Appl Pharmacol 85:24-38. https://doi.org/10.1016/0041-008x(86)90384-4.

Greig RA, Jones J. 1976. Nondestructive neutron activation analysis of marine organisms collected from ocean dump sites of the middle eastern United States. Arch Environ Contam Toxicol 4(4):420-434. https://doi.org/10.1007/BF02221039.

Grice HC, Goodman T, Munro IC, et al. 1969. Myocardial toxicity of cobalt in the rat. Ann N Y Acad Sci 156(1):189-194. https://doi.org/10.1111/j.1749-6632.1969.tb16727.x.

Gross RT, Kriss JP, Spaet TH. 1955. The hematopoletic and goltrogenic effects of cobaltous chloride in patients with sickle cell anemia. Pediatrics 15(3):284-290.

Guieu C, Martin JM, Thomas AJ, et al. 1991. Atmospheric versus river inputs of metals to the Gulf of Lions: Total concentrations, partitioning and fluxes. Mar Pollut Bull 22(4):176-183. https://doi.org/10.1016/0025-326X(91)90467-7.

Gumgum B, Unlu E, Tez Z, et al. 1994. Heavy metal pollution in water, sediment and fish from the Tigris river in Turkey. Chemosphere 29(1):111-116. https://doi.org/10.1016/0045-6535(94)90094-9.

Haddad E, Zikovsky L. 1985. Determination of Al, As, Co, Cr, Cs, Fe, Mn, Sb, Sc, W and Zn in the workroom air by instrumental neutron activation analysis. J Radioanal Nucl Chem 93(6):371-378. https://doi.org/10.1007/BF02210658.

Haga Y, Clyne N, Hatori N, et al. 1996. Impaired myocardial function following chronic cobalt exposure in an isolated rat heart model. Trace Elem Electrolytes 13(2):69-74.

Hagvall L, Pour MD, Feng J, et al. 2021. Skin permeation of nickel, cobalt and chromium salts in ex vivo human skin, visualized using mass spectrometry imaging. Toxicol In Vitro 76:105232. https://doi.org/10.1016/j.tiv.2021.105232.

Hakanson R, Lundquist I, Sundler F. 1974. Elevated levels of insulin-like activity and 5-hydroxytryptamine in guinea pig pancreas following $CoCl_2$ treatment. Endocrinology 94(2):318-324. https://doi.org/10.1210/endo-94-2-318.

Hamel SC, Buckley B, Lioy PJ. 1998. Bioaccessibility of metals in soils for different liquid to solid ratios in synthetic gastric fluid. Environ Sci Technol 32(3):358-362. https://doi.org/10.1021/es9701422.

Hamilton EI. 1994. The geobiochemistry of cobalt. Sci Total Environ 150(1-3):7-39. https://doi.org/10.1016/0048-9697(94)90126-0.

Hamilton-Koch W, Snyder RD, Lavelle JM. 1986. Mental-induced DNA damage and repair in human diploid fibroblasts and Chinese hamster ovary cells. Chem Biol Interact 59:17-28. https://doi.org/10.1016/S0009-2797(86)80052-7.

Hamzah NA, Mohd Tamrin SB, Ismail NH. 2014. Metal dust exposure and respiratory health of male steel workers in Terengganu, Malaysia. Iran J Publ Health 43:154-166.

Han I, Richner D, An Han H, et al. 2020. Evaluation of metal aerosols in four communities adjacent to metal recyclers in Houston, Texas, USA. J Air Waste Manag Assoc 70(5):568-579. https://doi.org/10.1080/10962247.2020.1755385.

Hanafy S, Soltan ME. 2004. Effects of vitamin E pretreatment on subacute toxicity of mixture of Co, Pb, and Hg nitrate-induced nephrotoxicity in rats. Environ Toxicol Pharmacol 17(3):159-167. https://doi.org/10.1016/j.etap.2004.04.006.

Hanini A, Massoudi ME, Gavard J, et al. 2016. Nanotoxicological study of polyol-made cobalt-zinc ferrite nanoparticles in rabbit. Environ Toxicol Pharmacol 45:321-327. https://doi.org/10.1016/j.etap.2016.06.010.

Hanna RGM. 1992. The level of heavy metals in the Red Sea after 50 years. Sci Total Environ 125:417-448. https://doi.org/10.1016/0048-9697(92)90405-H.

Hansen HS, Rygard J, Engelholm SA. 1976. Clinical use of combined bleomycin and radiation therapy for head and neck tumours and testicular cancers. Bull Cancer 68(3):371-378.

Hansen T, Clermont G, Alves A, et al. 2006. Biological tolerance of different materials in bulk and nanoparticulate form in a rat model: sarcoma development by nanoparticles. J R Soc Interface 3(11):767-775. https://doi.org/10.1098/rsif.2006.0145.

Hansson HC, Elkholm AKP, Ross HB. 1988. Rainwater analysis: A comparison between proton-induced x-ray emission and graphite furnace atomic absorption spectroscopy. Environ Sci Technol 22(5):527-531. https://doi.org/10.1021/es00170a007.

Harding HE. 1950. Notes on the toxicology of cobalt metal. Br J Ind Med 7(2):76-78. https://doi.org/10.1136/oem.7.2.76.

Harp MJ, Scoular FI. 1952. Cobalt metabolism of young college women on self-selected diets. J Nutr 47(1):67-72. https://doi.org/10.1093/jn/47.1.67.

Hartwig A, Kasten U, Boakye-Dankwa K, et al. 1990. Uptake and genotoxicity of micromolar concentrations of cobalt chloride in mammalian cells. Toxicol Environ Chem 28:205-215. https://doi.org/10.1080/02772249009357604.

Hartwig A, Snyder RD, Schlepegrell R, et al. 1991. Modulation by Co(II) of UV-induced DNA repair, mutagenesis and sister-chromatid exchanges in mammalian cells. Mutat Res 248(1):177-185. https://doi.org/10.1016/0027-5107(91)90099-a.

Hassan NHA, Fahmy MA, Farghaly AA, et al. 2006. Antimutagenic effect of selenium and vitamins against the genotoxicity induced by cobalt chloride in mice. Cytologia 71(3):213-222. https://doi.org/10.1508/cytologia.71.213.

Haynes WM. 2015. [Cobalt]. In: CRC handbook of chemistry and physics: A ready-reference book of chemical and physical data. 95th ed. Boca Raton, FL: CRC Press, 4.10, 14.59-14.61.

He J, Li J, Wu S, et al. 2023. Accumulation of blood chromium and cobalt in the participants with metal objects: findings from the 2015 to 2018 National Health and Nutrition Examination Survey (NHANES). BMC Geriatr 23(1):72. https://doi.org/10.1186/s12877-022-03710-3.

Heaton RW, Rahn KA, Lowenthal DH. 1990. Determination of trace elements, including regional tracers, in Rhode Island precipitation. Atmos Environ 24A(1):147-153. https://doi.org/10.1016/0960-1686(90)90450-2.

Hedbrant A, Eklund D, Andersson L, et al. 2022. Effects on white blood cell counts and the NLRP3 inflammasome due to dust and cobalt exposure in the hard metal industry. Biomarkers 27(1):60-70. https://doi.org/10.1080/1354750x.2021.2013538.

Hellou J, Fancey LL, Payne JF. 1992a. Concentrations of twenty-four elements in bluefin tuna, Thunnus thynnus from the Northwest Atlantic. Chemosphere 24(2):211-218. https://doi.org/10.1016/0045-6535(92)90394-7.

Helmers E, Schrems O. 1995. Wet deposition of metals to the tropical north and the south Atlantic Ocean. Atmos Environ 29(18):2475-2484. https://doi.org/10.1016/1352-2310(95)00159-V.

Hengstler JG, Bolm-Audorff U, Faldum A, et al. 2003. Occupational exposure to heavy metals: DNA damage induction and DNA repair inhibition prove co-exposures to cadmium, cobalt and lead as more dangerous than hitherto expected. Carcinogenesis 24(1):63-73. https://doi.org/10.1093/carcin/24.1.63.

Henquin JC, Lambert AE. 1975. Cobalt inhibition of insulin secretion and calcium uptake by isolated rat islets. Am J Physiol 228(6):1669-1677. https://doi.org/10.1152/ajplegacy.1975.228.6.1669.

Henquin JC, Schmeer W, Meissner HP. 1983. Forskolin, an activator of adenylate cyclase, increases CA2+-dependent electrical activity induced by glucose in mouse pancreatic B cells. Endocrinology 112(6):2218-2220. https://doi.org/10.1210/endo-112-6-2218.

Hewitt PJ. 1988. Accumulation of metals in the tissues of occupationally exposed workers. Environ Geochem Health 10(3-4):113-116. https://doi.org/10.1007/BF01758679.

Hillerdal G, Hartung M. 1983. On cobalt in tissues from hard metal workers. Int Arch Occup Environ Health 53(1):89-90. https://doi.org/10.1007/BF00406180.

Ho JH, Leikin JB, Dargan PI, et al. 2017. Metal-on-metal hip joint prostheses: A retrospective case series investigating the association of systemic toxicity with serum cobalt and chromium concentrations. J Med Toxicol 13(4):321-328. https://doi.org/10.1007/s13181-017-0629-1.

Hoet P, Jacquerye C, Deumer G, et al. 2013. Reference values and upper reference limits for 26 trace elements in the urine of adults living in Belgium. Clin Chem Lab Med 51(4):839-849. https://doi.org/10.1515/cclm-2012-0688.

Hoffmeister T, Schwenke D, Krug O, et al. 2018. Effects of 3 weeks of oral low-dose cobalt on hemoglobin mass and aerobic performance. Front Physiol 9:1289. https://doi.org/10.3389/fphys.2018.01289.

Hoffmeister T, Schwenke D, Wachsmuth N, et al. 2019. Erythropoietic effects of low-dose cobalt application. Drug Test Anal 11(2):200-207. https://doi.org/10.1002/dta.2478.

Holcombe LJ, Eynon BP, Switzer P. 1985. Variability of elemental concentrations in power plant ash. Environ Sci Technol 19(7):615-620. https://doi.org/10.1021/es00137a006.

Hollins JG, McCullough RS. 1971. Radiation dosimetry of internal contamination by inorganic compounds of cobalt: an analysis of cobalt metabolism in rats. Health Phys 21(2):233-246. https://doi.org/10.1097/00004032-197108000-00010.

Holly RG. 1955. Studies on iron and cobalt metabolism. J Am Med Assoc 158(15):1349-1352. https://doi.org/10.1001/jama.1955.02960150019005.

Holy CE, Zhang S, Perkins LE, et al. 2022. Site-specific cancer risk following cobalt exposure via orthopedic implants or in occupational settings: A systematic review and meta-analysis. Regul Toxicol Pharmacol 129:105096. https://doi.org/10.1016/j.yrtph.2021.105096.

Hong HH, Hoenerhoff MJ, Ton TV, et al. 2015. Kras, Egfr, and Tp53 mutations in B6C3F1/N mouse and F344/NTac rat alveolar/bronchiolar carcinomas resulting from chronic inhalation exposure to cobalt metal. Toxicol Pathol 43(6):872-882. https://doi.org/10.1177/0192623315581192.

Horiguchi H, Oguma E, Nomoto S, et al. 2004. Acute exposure to cobalt induces transient methemoglobinuria in rats. Toxicol Lett 151(3):459-466. https://doi.org/10.1016/j.toxlet.2004.03.018.

Horng CJ, Horng PH, Hsu JW, et al. 2003. Simultaneous determination of urinary cadmium, cobalt, lead, and nickel concentrations in steel production workers by differential pulse stripping voltammetry. Arch Environ Health 58(2):104-110. https://doi.org/10.3200/AEOH.58.2.104-110.

Houeto P, Houze P, Baud FJ. 2018. Comparative study of the tissue distribution of equimolar repeated doses of hydroxocobalamin and cobalt chloride in the rats. Ann Biol Clin (Paris) 76(2):179-184. https://doi.org/10.1684/abc.2017.1318.

Houk AEH, Thomas AW, Sherman HC. 1946. Some interrelationships of dietary iron, copper and cobalt in metabolism. J Nutr 31:609-620. https://doi.org/10.1093/jn/31.5.609.

Hu X, Zheng T, Cheng Y, et al. 2015. Distributions of heavy metals in maternal and cord blood and the association with infant birth weight in China. J Reprod Med 60(1-2):21-29.

Huber AL, Loving TJ. 1991. Fatal asthma attack after inhaling sulfur fumes. JAMA 266(16):2225.

Hussien NA, Mohamed HRH. 2018. The protective role of omega-3 against genotoxicity and reproductive toxicity of cobalt oxide nanoparticles acute treatment in male mice. Asian J Pharmaceut Clin Res 11(5):423. https://doi.org/10.22159/ajpcr.2018.v11i5.25245.

Hutter HP, Wallner P, Moshammer H, et al. 2016. Dust and cobalt levels in the Austrian tungsten industry: Workplace and human biomonitoring data. Int J Environ Res Public Health 13(9):931. https://doi.org/10.3390/ijerph13090931.

Huy TXN, Nguyen TT, Reyes AWB, et al. 2022. Cobalt (II) chloride regulates the invasion and survival of Brucella abortus 544 in RAW 264.7 cells and B6 mice. Pathogens 11(5):596. https://doi.org/10.3390/pathogens11050596.

IAEA. 1982. Elemental composition of human and animal milk: A review. . Vienna, Italy: International Atomic Energy Agency. World Health Organization. IAEA-TECDOC-269. https://inis.iaea.org/collection/NCLCollectionStore/_Public/14/767/14767925.pdf. December 7, 2023.

IARC. 1991. Chlorinated drinking-water; chlorination by-products; some other halogenated compounds; cobalt and cobalt compounds. IARC monographs on the evaluation of carcinogenic risks to humans. Vol. 52. Lyon, France: World Health Organization, International Agency for Research on Cancer. 125-127, 363-450. https://monographs.iarc.who.int/wp-content/uploads/2018/06/mono52.pdf. December 6, 2023.

IARC. 2006. Cobalt in hard metals and cobalt sulfate, gallium arsenide, indium phosphide and vanadium pentoxide. IARC monographs on the identification of carcinogenic hazards to humans. Vol. 86. Lyon, France: International Agency for Research on Cancer, World Health Organization. https://publications.iarc.fr/104. February 7, 2024.

IARC. 2023. Cobalt, antimony compounds, and weapons-grade tungsten alloy. IARC monographs on the identification of carcinogenic hazards to humans. Vol. 131. Lyon, France: International Agency for Research on Cancer, World Health Organization. 49-355. https://publications.iarc.fr/618. February 6, 2024.

Iarmarcovai G, Sari-Minodier I, Chaspoul F, et al. 2005. Risk assessment of welders using analysis of eight metals by ICP-MS in blood and urine and DNA damage evaluation by the comet and micronucleus assays; influence of XRCC1 and XRCC3 polymorphisms. Mutagenesis 20(6):425-432. https://doi.org/10.1093/mutage/gei058.

Ichikawa Y, Kusaka Y, Goto S. 1985. Biological monitoring of cobalt exposure, based on cobalt concentrations in blood and urine. Int Arch Occup Environ Health 55(4):269-276. https://doi.org/10.1007/BF00377685.

ICRP. 1979. Limits for intakes of radionuclides by workers. Annals of the ICRP. Vol. 2(3/4). New York: Pergamon Press, International Commission on Radiological Protection. https://www.icrp.org/publication.asp?id=ICRP%20Publication%2030%20(Part%201). December 6, 2023.

ICRP. 1994. Human respiratory tract model for radiological protection. Pergamon Press. International Commission on Radiological Protection. ICRP Publication 66. https://journals.sagepub.com/doi/pdf/10.1177/ANIB_24_1-3. December 6, 2023.

ICRP. 1995. Cobalt. International Commission on Radiological Protection. Ann ICRP 25(3-4):19-25. https://www.icrp.org/publication.asp?id=ICRP%20Publication%2071. December 8, 2023.

ICRP. 2016. ICRP Publication 134: Occupational intakes of radionuclides: Part 2. International Commission on Radiological Protection. Ann ICRP 45(3-4):7-349. https://doi.org/10.1177/0146645316670045.

Ikarashi Y, Ohno K, Tsuchiya T, et al. 1992a. Differences of draining lymph node cell proliferation among mice, rats and guinea pigs following exposure to metal allergens. Toxicology 76:283-292. https://doi.org/10.1016/0300-483X(92)90196-L.

Ikarashi Y, Tsuchiya T, Nakamura A. 1992b. Detection of contact sensitivity of metal salts using the murine local lymph node assay. Toxicol Lett 62:53-61. https://doi.org/10.1016/0378-4274(92)90078-X.

Imbrogno P, Alborghetti F. 1994. Evaluation and comparison of the levels of occupational exposure to cobalt during dry and/or wet hard metal sharpening. Environmental and biological monitoring. Sci Total Environ 150:259-262. https://doi.org/10.1016/0048-9697(94)90163-5.

Inaba J, Suzuki-Yasumoto M. 1979. A kinetic study of radionuclide absorption through damaged and undamaged skin of the guinea pig. Health Phys 37(4):592-595.

Inaba J, Nishimura Y, Ichikawa R. 1980. Comparative metabolism of ^{54}Mn, ^{59}Fe, ^{60}Co and ^{65}Zn incorporated into Chlorella and in inorganic form in rats. Health Phys 39:611-617. https://doi.org/10.1097/00004032-198010000-00003.

Inozemtsev AN, Bokieva SB, Karpukhina OV, et al. 2008. Effects of combined treatment with heavy metals and piracetam on learning and memory in rats. Dokl Biol Sci 422:301-304. https://doi.org/10.1134/s0012496608050062.

IRIS. 2023. Cobalt and cobalt compounds. Integrated Risk Information System: Chemical landing page. Washington, DC: U.S. Environmental Protection Agency. https://iris.epa.gov/ChemicalLanding/&substance_nmbr=708. November 27, 2023.

Ishihara N, Yoshida A, Koizumi M. 1987. Metal concentrations in human pancreatic juice. Arch Environ Health 42(6):356-360. https://doi.org/10.1080/00039896.1987.9934359.

Jackman AP, Kennedy VC, Bhatia N. 2001. Interparticle migration of metal cations in stream sediments as a factor in toxics transport. J Hazard Mater B82:27-41. https://doi.org/10.1016/s0304-3894(00)00349-6.

Jacobziner H, Raybin HW. 1961. Poison control... Accidental cobalt poisoning. Arch Pediatr 78:200-205.

James AC, Stahlhofen W, Rudolf G, et al. 1994. Annexe D. Deposition of inhaled particles. Ann ICRP 24(1-3):231-299. https://doi.org/10.1016/0146-6453(94)90042-6.

Jansen HM, Knollema S, van der Duin LV, et al. 1996. Pharmacokinetics and dosimetry of cobalt-55 and cobalt-57. J Nucl Med 37(12):2082-2086.

Jefferson JA, Escudero E, Hurtado ME, et al. 2002. Excessive erythrocytosis, chronic mountain sickness, and serum cobalt levels. Lancet 359(9304):407-408. https://doi.org/10.1016/s0140-6736(02)07594-3.

Jervois. 2024. Idaho cobalt operations. Jervois. https://jervoisglobal.com/projects/idaho-cobalt-operations/. September 30, 2024.

Jin R, Zhu X, Shrubsole MJ, et al. 2018. Associations of renal function with urinary excretion of metals: Evidence from NHANES 2003-2012. Environ Int 121(Pt 2):1355-1362. https://doi.org/10.1016/j.envint.2018.11.002.

Johansson A, Robertson B, Camner P. 1987. Nodular accumulation of type II cells and inflammatory lesions caused by inhalation of low cobalt concentrations. Environ Res 43(1):227-243. https://doi.org/10.1016/s0013-9351(87)80074-9.

Johansson A, Curstedt T, Camner P. 1991. Lung lesions after combined inhalation of cobalt and nickel. Environ Res 54(1):24-38. https://doi.org/10.1016/s0013-9351(05)80192-6.

Johansson A, Curstedt T, Rasool O, et al. 1992. Rabbit lung after combined exposure to soluble cobalt and trivalent chromium. Environ Res 58(1):80-96. https://doi.org/10.1016/s0013-9351(05)80206-3.

Jorhem L, Sundstrom B. 1993. Levels of lead, cadmium, zinc, copper, nickel, chromium, manganese, and cobalt in foods on the Swedish market, 1983-1990. J Food Compost Anal 6:223-241. https://doi.org/10.1006/jfca.1993.1025.

Julander A, Skare L, Mulder M, et al. 2010. Skin deposition of nickel, cobalt, and chromium in production of gas turbines and space propulsion components. Ann Occup Hyg 54(3):340-350. https://doi.org/10.1093/annhyg/meq002.

Junque E, Grimalt JO, Fernandez-Somoano A, et al. 2020. Urinary cobalt and ferritin in four-years-old children. Environ Res 183:109147. https://doi.org/10.1016/j.envres.2020.109147.

Kada T, Kanematsu N. 1978. Reduction of N-methyl-N'-nitro-N-nitrosoguanidine-induced mutations by cobalt chloride in Escherichia coli. Proc Japan Acad Ser B 54B:234-237.

Kakinuma J, Orii H. 1982. DNA interaction with 57Co-bleomycin. Nuklearmedizin 21(6):232-235.

Kanematsu N, Hara M, Kada T. 1980. Rec assay and mutagenicity studies on metal compounds. Mutat Res 77(2):109-116. https://doi.org/10.1016/0165-1218(80)90127-5.

Kapstad B. 1978. Treatment of squamous cell carcinomas of the head and neck region with cobalt and bleomycin. Int J Radiat Oncol Biol Phys 4(1-2):91-94. https://doi.org/10.1016/0360-3016(78)90121-9.

Kapstad B. 1979. Cobalt and bleomycin against carcinomas of head and neck. A controlled clinical study. Acta Otolaryngol Suppl 360:171-173. https://doi.org/10.3109/00016487809123507.

Karduri RKR. 2023. Cobalt in battery production: implications for the mining community. Int J Adv Res Basic Eng Sci Technol 10(11):9-15.

Kargar F, Shahtaheri SJ, Golbabaei F, et al. 2013. Evaluation of occupational exposure of glazers of a ceramic industry to cobalt blue dye. Iran J Publ Health 42(8):868-875.

Kasprzak KS, Zastawny TH, North SL, et al. 1994. Oxidative DNA base damage in renal, hepatic, and pulmonary chromatin of rats after intraperitoneal injection of cobalt(II) acetate. Chem Res Toxicol 7(3):329-335. https://doi.org/10.1021/tx00039a009.

Kasten U, Mullenders LH, Hartwig A. 1997. Cobalt(II) inhibits the incision and the polymerization step of nucleotide excision repair in human fibroblasts. Mutat Res 383(1):81-89. https://doi.org/10.1016/s0921-8777(96)00052-3.

Kawakami T, Hanao N, Nishiyama K, et al. 2012. Differential effects of cobalt and mercury on lipid metabolism in the white adipose tissue of high-fat diet-induced obesity mice. Toxicol Appl Pharmacol 258(1):32-42. https://doi.org/10.1016/j.taap.2011.10.004.

Kaya B, Creus A, Velazquez A, et al. 2002. Genotoxicity is modulated by ascorbic acid. Studies using the wing spot test in Drosophila. Mutat Res 520(1-2):93-101. https://doi.org/10.1016/s1383-5718(02)00173-0.

Kayembe-Kitenge T, Nkulu CBL, Musanzayi SM, et al. 2023. Transplacental transfer of cobalt: Evidence from a study of mothers and their neonates in the African Copperbelt. J Trace Elem Med Biol 80:127294. https://doi.org/10.1016/j.jtemb.2023.127294.

Kennedy KJ, Esmen NA, Buchanich JM, et al. 2017. Mortality among hardmetal production workers: Occupational exposures. J Occup Environ Med 59(12):e297-e305. https://doi.org/10.1097/JOM.0000000000001068.

Kent NL, McCance RA. 1941. The absorption and excretion of 'minor' elements by man: Silver, gold, lithium, boron and vanadium. Biochem J 35(7):837-844. https://doi.org/10.1042/bj0350837.

Kerfoot EJ. 1974. Semi-chronic inhalation study on cobalt: a dissertation. Doctorate in Philosophy: Physiology. Ann Arbor, MI: Wayne State University.

Kesteloot H, Roelandt J, Willems J, et al. 1968. An enquiry into the role of cobalt in the heart disease of chronic beer drinkers. Circulation 37(5):854-864. https://doi.org/10.1161/01.cir.37.5.854.

Kettelarij J, Nilsson S, Midander K, et al. 2016. Snapshot of cobalt, chromium and nickel exposure in dental technicians. Contact Dermatitis 75(6):370-376. https://doi.org/10.1111/cod.12681.

Kettelarij J, Midander K, Liden C, et al. 2018a. Contamination of skin and surfaces by cobalt in the hard metal industry. Contact Dermatitis 79(4):226-231. https://doi.org/10.1111/cod.13056.

Kettelarij J, Midander K, Liden C, et al. 2018b. Neglected exposure route: cobalt on skin and its associations with urinary cobalt levels. Occup Environ Med 75(11):837-842. https://doi.org/10.1136/oemed-2018-105099.

Khalil SR, El Bohi KM, Khater S, et al. 2020. Moringa oleifera leaves ethanolic extract influences DNA damage signaling pathways to protect liver tissue from cobalt -triggered apoptosis in rats. Ecotoxicol Environ Saf 200:110716. https://doi.org/10.1016/j.ecoenv.2020.110716.

Khan MR, Ahmad N, Ouladsmane M, et al. 2021. Heavy metals in acrylic color paints intended for the school children use: a potential threat to the children of early age. Molecules 26(8):2375. https://doi.org/10.3390/molecules26082375.

Khan MU, Ahmed M, Nazim K, et al. 2022. Bioaccumulation of heavy metals in Poecilia reticulata (guppy fish): an important biotic component of food chain. J Black Sea/Mediterr Environ 28(1):97-110.

Kharab P, Singh I. 1985. Genotoxic effects of potassium dichromate, sodium arsenite, cobalt chloride and lead nitrate in diploid yeast. Mutat Res 155(3):117-120. https://doi.org/10.1016/0165-1218(85)90128-4.

Killey RW, McHugh JO, Champ DR, et al. 1984. Subsurface cobalt-60 migration from a low-level waste disposal site. Environ Sci Technol 18(3):148-157. https://doi.org/10.1021/es00121a004.

Kim EY, Goto R, Tanabe S, et al. 1998. Distribution of 14 elements in tissues and organs of oceanic seabirds. Arch Environ Contam Toxicol 35(4):638-645. https://doi.org/10.1007/s002449900426.

Kincaid JF, Strong JS, Sunderman FW. 1954. Toxicity studies of cobalt carbonyls. AMA Arch Ind Health 10(3):210-212.

King LD. 1988. Retention of metals by several soils of the southeastern United States. J Environ Qual 17(2):239-246. https://doi.org/10.2134/jeq1988.00472425001700020013x.

Kinoshita K, Fujita T. 1972. Metabolism of ^{57}Co-methylcobalamin in rat and guinea pig. Chem Pharm Bull 20(12):2561-2569. https://doi.org/10.1248/cpb.20.2561.

Kirchgessner M, Reuber S, Kreuzer M. 1994. Endogenous excretion and true absorption of cobalt as affected by the oral supply of cobalt. Biol Trace Elem Res 41:175-189. https://doi.org/10.1007/BF02917227.

Kirkland D, Brock T, Haddouk H, et al. 2015. New investigations into the genotoxicity of cobalt compounds and their impact on overall assessment of genotoxic risk. Regul Toxicol Pharmacol 73(1):311-338. https://doi.org/10.1016/j.yrtph.2015.07.016.

Klasson M, Lindberg M, Bryngelsson IL, et al. 2017. Biological monitoring of dermal and air exposure to cobalt at a Swedish hard metal production plant: does dermal exposure contribute to uptake? Contact Dermatitis 77(4):201-207. https://doi.org/10.1111/cod.12790.

Kloke A, Sauerbeck DR, Vetter H. 1984. The contamination of plants and soils with heavy metals and the transport of metals in terrestrial food chains. In: Nriagu JO, ed. Changing metal cycles and human health. Berlin, Germany: Springer-Verlag, 113-141.

Knauer GA, Martin JH, Gordon RM. 1982. Cobalt in north-east Pacific waters. Nature 297(5861):49-51. https://doi.org/10.1038/297049a0.

Knopfel M, Smith C, Solioz M. 2005. ATP-driven copper transport across the intestinal brush border membrane. Biochem Biophys Res Commun 330(3):645-652. https://doi.org/10.1016/j.bbrc.2005.03.023.

Knutson AB, Klerks PL, Levinton JS. 1987. The fate of metal contaminated sediments in Foundry Cove, New York. Environ Pollut 45(4):291-304. https://doi.org/10.1016/0269-7491(87)90103-5.

Kocylowski R, Grzesiak M, Gaj Z, et al. 2019. Associations between the level of trace elements and minerals and folate in maternal serum and amniotic fluid and congenital abnormalities. Nutrients 11(2):328. https://doi.org/10.3390/nu11020328.

Kokelj F, Daris F, Lutmann A, et al. 1994. Nickel, chromate and cobalt in toilet soaps analyzed by inductively coupled plasma mass spectrometry. Contact Dermatitis 31:270. https://doi.org/10.1111/j.1600-0536.1994.tb02009.x.

Koponen M, Gustafsson T, Kalliomaki P-L. 1982. Cobalt in hard metal manufacturing dusts. Am Ind Hyg Assoc J 43(9):645-651. https://doi.org/10.1080/15298668291410350.

Kopp B, Zalko D, Audebert M. 2018. Genotoxicity of 11 heavy metals detected as food contaminants in two human cell lines. Environ Mol Mutagen 59(3):202-210. https://doi.org/10.1002/em.22157.

Kovacheva-Ninova VK, Savov GM, Vassileva V, et al. 2018. Trends in the development of cobalt production. Electrotech Electron 53:84-94.

Krakowiak A, Dudek W, Tarkowski M, et al. 2005. Occupational asthma caused by cobalt chloride in a diamond polisher after cessation of occupational exposure: a case report. Int J Occup Med Environ Health 18(2):151-158.

Krasovskii GN, Fridlyand SA. 1971. Experimental data for the validation of the maximum permissible concentration of cobalt in water bodies. Hyg Sanit 26:277-279.

Krecisz B, Kiec-Swierczynska M, Krawczyk P, et al. 2009. Cobalt-induced anaphylaxis, contact urticaria, and delayed allergy in a ceramics decorator. Contact Dermatitis 60(3):173-174. https://doi.org/10.1111/j.1600-0536.2008.01465.x.

Kreyling WG. 1990. Interspecies comparison of lung clearance of "insoluble" particles. J Aerosol Med 3(S1):S93-S110. https://doi.org/10.1089/jam.1990.3.Suppl_1.S-93.

Kreyling WG, Ferron GA, Haider B. 1984. Lung retention and clearance of cobalt oxide particles depending on their physicochemical parameters. EUR 9384:141-146.

Kreyling WG, Ferron GA, Haider B. 1986. Metabolic fate of inhaled Co aerosols in beagle dogs. Health Phys 51(6):773-795. https://doi.org/10.1097/00004032-198612000-00007.

Kreyling WG, Ferron GA, Haider B. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles- Part IV: Lung clearance of inhaled cobalt oxide particles in beagle dogs. J Aerosol Sci 20(2):219-232. https://doi.org/10.1016/0021-8502(89)90045-1.

Kreyling WG, André S, Collier CG, et al. 1991. Interspecies comparison of lung clearance after inhalation of monodisperse, solid cobalt oxide aerosol particles. J Aerosol Sci 22(4):509-535. https://doi.org/10.1016/0021-8502(91)90008-6.

Kriss JP, Carnes WH, Gross RT. 1955. Hypothyroidism and thyroid hyperplasia in patients treated with cobalt. J Am Med Assoc 157(2):117-121. https://doi.org/10.1001/jama.1955.02950190017004.

Kumagai S, Kusaka Y, Goto S. 1996. Cobalt exposure level and variability in the hard metal industry of Japan. Am Ind Hyg Assoc J 57(4):365-369. https://doi.org/10.1080/15428119691014909.

Kusaka Y, Ichikawa Y, Shirakawa T, et al. 1986a. Effect of hard metal dust on ventilatory function. Br J Ind Med 43(7):486-489. https://doi.org/10.1136/oem.43.7.486.

Kusaka Y, Yokoyama K, Sera Y, et al. 1986b. Respiratory diseases in hard metal workers: an occupational hygiene study in a factory. Br J Ind Med 43(7):474-485. https://doi.org/10.1136/oem.43.7.474.

Kyono H, Kusaka Y, Homma K, et al. 1992. Reversible lung lesions in rats due to short-term exposure to ultrafine cobalt particles. Ind Health 30(3-4):103-118. https://doi.org/10.2486/indhealth.30.103.

Lacy SA, Merritt K, Brown SA, et al. 1996. Distribution of nickel and cobalt following dermal and systemic administration with in vitro and in vivo studies. J Biomed Mater Res 32(2):279-283. https://doi.org/10.1002/(SICI)1097-4636(199610)32:2<279::AID-JBM18>3.0.CO;2-E.

Lai CH, Ho SC, Pan CH, et al. 2021. Chronic exposure to metal fume PM(2.5) on inflammation and stress hormone cortisol in shipyard workers: A repeat measurement study. Ecotoxicol Environ Saf 215:112144. https://doi.org/10.1016/j.ecoenv.2021.112144.

Laing ME, Hackett CB, Murphy GM. 2005. Unusual allergen in nurse uniform trousers. Contact Dermatitis 52(5):293. https://doi.org/10.1111/j.0105-1873.2005.0573i.x.

Lam CW, Castranova V, Driscoll K, et al. 2023. A review of pulmonary neutrophilia and insights into the key role of neutrophils in particle-induced pathogenesis in the lung from animal studies of lunar dusts and other poorly soluble dust particles. Crit Rev Toxicol 53(8):441-479. https://doi.org/10.1080/10408444.2023.2258925.

Lantin AC, Mallants A, Vermeulen J, et al. 2011. Absence of adverse effect on thyroid function and red blood cells in a population of workers exposed to cobalt compounds. Toxicol Lett 201(1):42-46. https://doi.org/10.1016/j.toxlet.2010.12.003.

Lantin AC, Vermeulen J, Mallants A, et al. 2013. Occupational exposure to cobalt is not associated with incipient signs of dilated cardiomyopathy in a Belgian refinery. Occup Environ Med 70(6):386-392. https://doi.org/10.1136/oemed-2012-100930.

Lantzy RJ, Mackenzie FT. 1979. Atmospheric trace metals: global cycles and assessment of man's impact. Geochim Cosmochim Acta 43:511-525. https://doi.org/10.1016/0016-7037(79)90162-5.

Lasfargues G, Wild P, Moulin JJ, et al. 1994. Lung cancer mortality in a French cohort of hard-metal workers. Am J Ind Med 26(5):585-595. https://doi.org/10.1002/ajim.4700260502.

Lasfargues G, Lardot C, Delos M, et al. 1995. The delayed lung responses to single and repeated intratracheal administration of pure cobalt and hard metal powder in the rat. Environ Res 69:108-121. https://doi.org/10.1006/enrs.1995.1032.

Lazarus SS, Goldner MG, Volk BW. 1953. Selective destruction of pancreatic alpha cells by cobaltous chloride in the dog; physiologic implications. Metabolism 2(6):513-520.

Lee JN, Kim SG, Lim JY, et al. 2016. 3-Aminotriazole protects from CoCl2-induced ototoxicity by inhibiting the generation of reactive oxygen species and proinflammatory cytokines in mice. Arch Toxicol 90(4):781-791. https://doi.org/10.1007/s00204-015-1506-9.

Lee YS, Sung JH, Song KS, et al. 2019. Derivation of occupational exposure limits for multi-walled carbon nanotubes and graphene using subchronic inhalation toxicity data and a multi-path particle dosimetry model. Toxicol Res (Camb) 8(4):580-586. https://doi.org/10.1039/c9tx00026g.

Leggett RW. 2008. The biokinetics of inorganic cobalt in the human body. Sci Total Environ 389(2-3):259-269. https://doi.org/10.1016/j.scitotenv.2007.08.054.

Legostaeva GA, Zaksas NP, Gluhcheva YG, et al. 2013. Effect of CoCl(2) on the content of different metals and a relative activity of DNA-hydrolyzing abzymes in the blood plasma of mice. J Mol Recognit 26(1):10-22. https://doi.org/10.1002/jmr.2217.

Leikin JB, Karydes HC, Whiteley PM, et al. 2013. Outpatient toxicology clinic experience of patients with hip implants. Clin Toxicol (Phila) 51(4):230-236. https://doi.org/10.3109/15563650.2013.768343.

Lenntech. 2023. Chemistry of cobalt. Lenntech B.V. https://www.lenntech.com/periodic/elements/co.htm. December 6, 2023.

Leonard KS, McCubbin D, Harvey BR. 1993a. Chemical speciation and environmental behaviour of ^{60}Co discharged from a nuclear establishment. J Environ Radioact 20:1-21. https://doi.org/10.1016/0265-931X(93)90015-Y.

Leonard KS, McCubbin D, Harvey BR. 1993b. A radiochemical procedure for the determination and speciation of radiocobalt in environmental waters. Sci Total Environ 130/131:237-251. https://doi.org/10.1016/0048-9697(93)90078-K.

Leyssens L, Vinck B, Van Der Straeten C, et al. 2020. The ototoxic potential of cobalt from metal-on-metal hip implants: Objective auditory and vestibular outcome. Ear Hear 41(1):217-230. https://doi.org/10.1097/AUD.0000000000000747.

Leyssens L, Vinck B, Van Der Straeten C, et al. 2021. The ototoxic potential of cobalt from metal-on-metal hip implants: a pilot study on the patient-reported auditory, vestibular, and general neurological outcome. Int J Audiol 60(1):44-53. https://doi.org/10.1080/14992027.2020.1789922.

Li P, Ding D, Salvi R, et al. 2015. Cobalt-induced ototoxicity in rat postnatal cochlear organotypic cultures. Neurotox Res 28(3):209-221. https://doi.org/10.1007/s12640-015-9538-8.

Li L, Mok H, Jhaveri P, et al. 2018. Anticancer therapy and lung injury: molecular mechanisms. Expert Rev Anticancer Ther 18(10):1041-1057. https://doi.org/10.1080/14737140.2018.1500180.

Lichtenstein ME, Bartl F, Pierce RT. 1975. Control of cobalt exposures during wet process tungsten carbide grinding. Am Ind Hyg Assoc J 36(12):879-885. https://doi.org/10.1080/0002889758507360.

Linauskiene K, Dahlin J, Ezerinskis Z, et al. 2021. Occupational exposure to nickel, cobalt, and chromium in the Lithuanian hard metal industry. Contact Dermatitis 84(4):247-253. https://doi.org/10.1111/cod.13756.

Linna A, Oksa P, Palmroos P, et al. 2003. Respiratory health of cobalt production workers. Am J Ind Med 44(2):124-132. https://doi.org/10.1002/ajim.10258.

Linna A, Oksa P, Groundstroem K, et al. 2004. Exposure to cobalt in the production of cobalt and cobalt compounds and its effect on the heart. Occup Environ Med 61(11):877-885. https://doi.org/10.1136/oem.2003.009605.

Linna A, Uitti J, Oksa P, et al. 2020. Effects of occupational cobalt exposure on the heart in the production of cobalt and cobalt compounds: a 6-year follow-up. Int Arch Occup Environ Health 93(3):365-374. https://doi.org/10.1007/s00420-019-01488-3.

Linnainmaa M, Kangas J, Kalliokoski P. 1996. Exposure to airborne metals in the manufacture and maintenance of hard metal and stellite blades. Am Ind Hyg Assoc J 57(2):196-201. https://doi.org/10.1080/15428119691015142.

Lisk DJ, Gutenmann WH, Rutzke M, et al. 1992. Survey of toxicants and nutrients in composted waste materials. Arch Environ Contam Toxicol 22:190-194. https://doi.org/10.1007/BF00213284.

Lison D. 2015. Cobalt. In: Nordberg GF, Fowler BA, Nordberg M, eds. Handbook on the toxicology of metals. 4th ed. San Diego: Academic Press, 743-763. https://doi.org/10.1016/B978-0-444-59453-2.00034-2.

Lison D, Buchet JP, Swennen B, et al. 1994. Biological monitoring of workers exposed to cobalt metal, salt, oxides, and hard metal dust. Occup Environ Med 51(7):447-450. https://doi.org/10.1136/oem.51.7.447.

Lison D, Carbonnelle P, Mollo L, et al. 1995. Physicochemical mechanism of the interaction between cobalt metal and carbide particles to generate toxic activated oxygen species. Chem Res Toxicol 8:600-606. https://doi.org/10.1021/tx00046a015.

Lison D, Lauwerys R, Demedts M, et al. 1996. Experimental research into the pathogenesis of cobalt/hard metal lung disease. Eur Respir J 9:1024-1028. https://doi.org/10.1183/09031936.96.09051024.

Little JA, Sunico R. 1958. Cobalt-induced goiter with cardiomegaly and congestive failure. J Pediatr 52(3):284-288. https://doi.org/10.1016/s0022-3476(58)80117-1.

Liu S, Hammond SK, Rojas-Cheatham A. 2013. Concentrations and potential health risks of metals in lip products. Environ Health Perspect 121(6):705-710. https://doi.org/10.1289/ehp.1205518.

Llobet JM, Domingo JL, Corbella J. 1988. Comparative effects of repeated parenteral administration of several chelators on the distribution and excretion of cobalt. Res Commun Chem Pathol Pharmacol 60(2):225-233.

Looker AC, Dallman PR, Carroll MD, et al. 1997. Prevalence of iron deficiency in the United States. JAMA 277(12):973-976. https://doi.org/10.1001/jama.1997.03540360041028.

Loven K, Isaxon C, Ahlberg E, et al. 2023. Size-resolved characterization of particles >10 nm emitted to air during metal recycling. Environ Int 174:107874. https://doi.org/10.1016/j.envint.2023.107874.

Lukac N, Massanyi P, Zakrzewski M, et al. 2007. Cobalt-induced alterations in hamster testes in vivo. J Environ Sci Health A Tox Hazard Subst Environ Eng 42(3):389-392. https://doi.org/10.1080/10934520601144709.

Mackie JA, Natali SM, Levinton JS, et al. 2007. Declining metal levels at Foundry Cove (Hudson River, New York): response to localized dredging of contaminated sediments. Environ Pollut 149(2):141-148. https://doi.org/10.1016/j.envpol.2007.01.010.

Maenhaut W, Zoller WH, Duce RA, et al. 1979. Concentration and size distribution of particulate trace elements in the South Polar atmosphere. J Geophys Res 84(C5):2421-2431. https://doi.org/10.1029/JC084iC05p02421.

Mahara Y, Kudo A. 1981. Interaction and mobility of cobalt-60 between water and sediments in marine environments possible effects by acid rain. Water Res 15(4):413-419. https://doi.org/10.1016/0043-1354(81)90051-8.

Mandervelt C, Clottens FL, Demedts M, et al. 1997. Assessment of the sensitization potential of five metal salts in the murine local lymph node assay. Toxicology 120(1):65-73. https://doi.org/10.1016/s0300-483x(97)03629-9.

Mantoura RFC, Dickson A, Riley JP. 1978. The complexation of metals with humic materials in natural waters. Estuarine Coastal Shelf Sci 6:387-408. https://doi.org/10.1016/0302-3524(78)90130-5.

Marsh GM, Buchanich JM, Zimmerman S, et al. 2017a. Mortality among hardmetal production workers: US cohort and nested case-control studies. J Occup Environ Med 59(12):e306-e326. https://doi.org/10.1097/JOM.0000000000001075.

Marsh GM, Buchanich JM, Zimmerman S, et al. 2017b. Mortality among hardmetal production workers: Pooled analysis of cohort data from an international investigation. J Occup Environ Med 59(12):e342-e364. https://doi.org/10.1097/JOM.0000000000001151.

Marshall E. 1984. Juarez: an unprecedented radiation accident. Science 223(4641):1152-1154. https://doi.org/10.1126/science.6701516.

Mateuca R, Aka PV, De Boeck M, et al. 2005. Influence of hOGG1, XRCC1 and XRCC3 genotypes on biomarkers of genotoxicity in workers exposed to cobalt or hard metal dusts. Toxicol Lett 156(2):277-288. https://doi.org/10.1016/j.toxlet.2004.12.002.

Mathur N, Jain GC, Pandey G. 2011. Hepatotoxicity of cobalt chloride in albino rat. Pharmacologyonline 2:179-185.

Mayfield KP, Lai J, Porreca F. 1994. Selective upregulation of opioid delta receptors in NG 108-15 cells by treatment with cobalt: Possible hypoxic regulation. Regul Peptides 54(1):183-184.

McElvenny DM, MacCalman LA, Sleeuwenhoek A, et al. 2017. Mortality among hardmetal production workers: UK cohort and nested case-control studies. J Occup Environ Med 59(12):e275-e281. https://doi.org/10.1097/JOM.0000000000001036.

McLaren RG, Lawson DM, Swift RS. 1986. Sorption and desorption of cobalt by soils and soil components. J Soil Sci 37:413-426. https://doi.org/10.1111/j.1365-2389.1986.tb00374.x.

McLean RI, Summers JK. 1990. Evaluation of transport and storage of 60Co, 134Cs, 137Cs and 65Zn by river sediments in the lower Susquehanna River. Environ Pollut 63(2):137-153. https://doi.org/10.1016/0269-7491(90)90064-j.

Medyńska-Juraszek A, Cwielag-Piasecka I, Jerzykiewicz M, et al. 2020. Wheat straw biochar as a specific sorbent of cobalt in soil. Materials (Basel) 13(11):2462. https://doi.org/10.3390/ma13112462.

Meltzer HM, Brantsaeter AL, Borch-Iohnsen B, et al. 2010. Low iron stores are related to higher blood concentrations of manganese, cobalt and cadmium in non-smoking, Norwegian women in the HUNT 2 study. Environ Res 110(5):497-504. https://doi.org/10.1016/j.envres.2010.03.006.

Meranger JC, Subramanian KS, Chalifoux C. 1981. Survey for cadmium, cobalt, chromium, copper, nickel, lead, zinc, calcium, and magnesium in Canadian drinking water supplies. J Assoc Off Anal Chem 64(1):44-53.

Merian E. 1985. Introduction on environmental chemistry and global cycles of chromium, nickel, cobalt, beryllium, arsenic, cadmium and selenium, and their derivatives. Curr Top Environ Toxicol Chem 8:3-32. https://doi.org/10.1080/02772248409357038.

Mermut AR, Jain JC, Song L, et al. 1996. Trace element concentrations of selected soils and fertilizers in Saskatchewan, Canada. J Environ Qual 25:845-853. https://doi.org/10.2134/jeq1996.00472425002500040028x.

Meyer-Bisch C, Pham QT, Mur JM, et al. 1989. Respiratory hazards in hard metal workers: a cross sectional study. Br J Ind Med 46(5):302-309. https://doi.org/10.1136/oem.46.5.302.

Michée IB, Merveille K, Tresort K, et al. 2023. Assessment of soil pollution by metallic trace elements (MTE): case of environment of Ruashi Mining/Haut-Katanga (DR Congo). Eur J Environ Earth Sci 4(1):69-72. https://doi.org/10.24018/ejgeo.2023.4.1.338.

Midander K, Julander A, Skare L, et al. 2014. Cobalt skin dose resulting from short and repetitive contact with hard metals. Contact Dermatitis 70(6):361-368. https://doi.org/10.1111/cod.12198.

Midander K, Hurtig A, Borg Tornberg A, et al. 2016. Allergy risks with laptop computers - nickel and cobalt release. Contact Dermatitis 74(6):353-359. https://doi.org/10.1111/cod.12525.

Milford JB, Davidson CI. 1985. The sizes of particulate trace elements in the atmosphere-a review. J Air Pollut Control Assoc 35(12):1249-1260. https://doi.org/10.1080/00022470.1985.10466027.

Miller AC, Mog S, McKinney L, et al. 2001. Neoplastic transformation of human osteoblast cells to the tumorigenic phenotype by heavy metal-tungsten alloy particles: induction of genotoxic effects. Carcinogenesis 22(1):115-125. https://doi.org/10.1093/carcin/22.1.115.

Miyaki M, Akamatsu N, Ono T, et al. 1979. Mutagenicity of metal cations in cultured cells from Chinese hamster. Mutat Res 68(3):259-263. https://doi.org/10.1016/0165-1218(79)90157-5.

Moche H, Chevalier D, Vezin H, et al. 2015. Genotoxicity of tungsten carbide-cobalt (WC-Co) nanoparticles in vitro: mechanisms-of-action studies. Mutat Res Genet Toxicol Environ Mutagen 779:15-22. https://doi.org/10.1016/j.mrgentox.2015.02.002.

Mochizuki H, Kada T. 1982. Antimutagenic action of cobaltous chloride on Trp-P-1-induced mutations in Salmonella typhimurium TA98 and TA1538. Mutat Res 95(2-3):145-157. https://doi.org/10.1016/0027-5107(82)90253-6.

Moger WH. 1983. Effects of the calcium-channel blockers cobalt, verapamil, and D600 on Leydig cell steroidogenesis. Biol Reprod 28(3):528-535. https://doi.org/10.1095/biolreprod28.3.528.

Mohamed AA, Metwally MMM, Khalil SR, et al. 2019. Moringa oleifera extract attenuates the CoCl2 induced hypoxia of rat's brain: Expression pattern of HIF-1α, NF-kB, MAO and EPO. Biomed Pharmacother 109:1688-1697. https://doi.org/10.1016/j.biopha.2018.11.019.

Mohiuddin SM, Taskar PK, Rheault M, et al. 1970. Experimental cobalt cardiomyopathy. Am Heart J 80(4):532-543. https://doi.org/10.1016/0002-8703(70)90202-4.

Mohmand J, Eqani SA, Fasola M, et al. 2015. Human exposure to toxic metals via contaminated dust: Bio-accumulation trends and their potential risk estimation. Chemosphere 132:142-151. https://doi.org/10.1016/j.chemosphere.2015.03.004.

Mollenhauer HH, Corrier DE, Clark DE, et al. 1985. Effects of dietary cobalt on testicular structure. Virchows Arch B Cell Pathol Incl Mol Pathol 49(3):241-248. https://doi.org/10.1007/BF02912101.

Monteiller C, Tran L, MacNee W, et al. 2007. The pro-inflammatory effects of low-toxicity low-solubility particles, nanoparticles and fine particles, on epithelial cells in vitro: the role of surface area. Occup Environ Med 64(9):609-615. https://doi.org/10.1136/oem.2005.024802.

Morelli L, Di Giulio C, Iezzi M, et al. 1994. Effect of acute and chronic cobalt administration on carotid body chemoreceptors responses. Sci Total Environ 150(1-3):215-216. https://doi.org/10.1016/0048-9697(94)90153-8.

Morfeld P, Gross JV, Erren TC, et al. 2017. Mortality among hardmetal production workers: German historical cohort study. J Occup Environ Med 59(12):e288-e296. https://doi.org/10.1097/JOM.0000000000001061.

Morin YL, Foley AR, Martineau G, et al. 1967. Quebec beer-drinkers' cardiomyopathy: forty-eight cases. Can Med Assoc J 97(15):881-883.

Morin Y, Tetu A, Mercier G. 1971. Cobalt cardiomyopathy: clinical aspects. Br Heart J 33(Suppl):175-178. https://doi.org/10.1136/hrt.33.suppl.175.

Morvai V, Szakmary E, Tatrai E, et al. 1993. The effects of simultaneous alcohol and cobalt chloride administration on the cardiovascular system of rats. Acta Physiol Hung 81(3):253-261.

Mosconi G, Bacis M, Vitali MT, et al. 1994. Cobalt excretion in urine: results of a study on workers producing diamond grinding tools and on a control group. Sci Total Environ 150(1-3):133-139. https://doi.org/10.1016/0048-9697(94)90140-6.

Moshtaghie AA, Badii A, Mohammadian T. 2004. The comparative study of binding characteristics of cobalt and iron to human serum transferrin. J Res Med Sci 6:250-254.

Moulin JJ, Wild P, Mur JM, et al. 1993. A mortality study of cobalt production workers: an extension of the follow-up. Am J Ind Med 23(2):281-288. https://doi.org/10.1002/ajim.4700230205.

Moulin JJ, Wild P, Romazini S, et al. 1998. Lung cancer risk in hard-metal workers. Am J Epidemiol 148(3):241-248. https://doi.org/10.1093/oxfordjournals.aje.a009631.

Moulin JJ, Clavel T, Roy D, et al. 2000. Risk of lung cancer in workers producing stainless steel and metallic alloys. Int Arch Occup Environ Health 73(3):171-180. https://doi.org/10.1007/s004200050024.

Müller H, Müller W, Wehner M, et al. 2012. Artists' colors. In: Ullmann's encyclopedia of industrial chemistry. Vol. 4. Wiley-VCH Verlag GmbH & Co. KGaA, 241-254. https://doi.org/10.1002/14356007.a03_143.pub2.

Mumtaz MM, Ray M, Crowell SR, et al. 2012a. Translational research to develop a human PBPK models tool kit-volatile organic compounds (VOCs). J Toxicol Environ Health A 75(1):6-24. https://doi.org/10.1080/15287394.2012.625546.

Mumtaz M, Fisher J, Blount B, et al. 2012b. Application of physiologically based pharmacokinetic models in chemical risk assessment. J Toxicol 2012:904603. https://doi.org/10.1155/2012/904603.

Mur JM, Moulin JJ, Charruyer-Seinerra MP, et al. 1987. A cohort mortality study among cobalt and sodium workers in an electrochemical plant. Am J Ind Med 11(1):75-81. https://doi.org/10.1002/ajim.4700110108.

Muramatsu Y, Parr RM. 1988. Concentrations of some trace elements in hair, liver and kidney from autopsy subjects - Relationship between hair and internal organs. Sci Total Environ 76:29-40. https://doi.org/10.1016/0048-9697(88)90280-x.

Murdock HR. 1959. Studies on the pharmacology of cobalt chloride. J Am Pharm Assoc 48(3):140-142. https://doi.org/10.1002/jps.3030480303.

Murthy GK, Rhea U, Peeler JT. 1971. Levels of antimony, cadmium, chromium, cobalt, manganese, and zinc in institutional total diets. Environ Sci Technol 5(5):436-442. https://doi.org/10.1021/es60052a009.

Mutafova-Yambolieva V, Staneva-Stoytcheva D, Lasova L, et al. 1994. Effects of cobalt or nickel on the sympathetically mediated contractile responses in rat-isolated vas deferens. Pharmacology 48(2):100-110. https://doi.org/10.1159/000139168.

Mwesigye AR, Young SD, Bailey EH, et al. 2016. Population exposure to trace elements in the Kilembe copper mine area, Western Uganda: A pilot study. Sci Total Environ 573:366-375. https://doi.org/10.1016/j.scitotenv.2016.08.125.

Nakaona L, Maseka KK, Hamilton EM, et al. 2020. Using human hair and nails as biomarkers to assess exposure of potentially harmful elements to populations living near mine waste dumps. Environ Geochem Health 42(4):1197-1209. https://doi.org/10.1007/s10653-019-00376-6.

NAS/NRC. 2006. Human biomonitoring for environmental chemicals. Washington, DC: The National Academies Press, National Research Council. https://doi.org/10.17226/11700.

Nation JR, Bourgeois AE, Clark DE, et al. 1983. The effects of chronic cobalt exposure on behavior and metallothionein levels in the adult rat. Neurobehav Toxicol Teratol 5(1):9-15.

Naylor GP, Harrison JD. 1995. Gastrointestinal iron and cobalt absorption and iron status in young rats and guinea pigs. Hum Exp Toxicol 14(12):949-954. https://doi.org/10.1177/096032719501401203.

Nemery B, Casier P, Roosels D, et al. 1992. Survey of cobalt exposure and respiratory health in diamond polishers. Am Rev Respir Dis 145(3):610-616. https://doi.org/10.1164/ajrccm/145.3.610.

Newton D, Rundo J. 1971. The long-term retention of inhaled cobalt-60. Health Phys 21(3):377-384. https://doi.org/10.1097/00004032-197109000-00003.

Nimmo M, Chester R. 1993. The chemical speciation of dissolved nickel and cobalt in Mediterranean rainwaters. Sci Total Environ 135:153-160. https://doi.org/10.1016/0048-9697(93)90286-F.

Nimmo M, Fones GR. 1997. The potential pool of Co, Ni, Cu, Pb and Cd organic complexing ligands in coastal and urban rain waters. Atmos Environ 31(5):693-702. https://doi.org/10.1016/s1352-2310(96)00243-9.

NIOSH. 1989. Health hazard evaluation-report no. HETA 85-295-1907. General Electric Carboloy Systems, Detroit, Michigan. Cincinnati, OH: National Institute for Occupational Safety and Health. PB89121008. https://www.cdc.gov/niosh/hhe/reports/pdfs/85-295-1907.pdf. December 8, 2023.

NIOSH. 1994. Cobalt metal dust and fume (as Co). Immediately dangerous to life or health (IDLH) values. The National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/idlh/7440484.html. November 27, 2023.

NIOSH. 2013. Occupational exposure to carbon nanotubes and nanofibers. National Institute for Occupational Safety and Health. Current intelligence bulletin 65. DHHS (NIOSH) Publication No. 2013–145. https://www.cdc.gov/niosh/docs/2013-145/default.html. December 5, 2023.

NIOSH. 2019a. Cobalt carbonyl (as Co). NIOSH pocket guide to chemical hazards. The National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/npg/npgd0147.html. November 27, 2023.

NIOSH. 2019b. Cobalt hydrocarbonyl (as Co). NIOSH pocket guide to chemical hazards. The National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/npg/npgd0148.html. November 27, 2023.

NIOSH. 2019c. Cobalt metal dust and fume (as Co). NIOSH pocket guide to chemical hazards. The National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/npg/npgd0146.html. November 27, 2023.

Nishimura Y, Inaba J, Ichikawa R. 1978. Fetal uptake of $^{60}CoCl_2$ and ^{57}Co-cyanocobalamin in different gestation stages of rats. J Radiat Res 19(3):236-245. https://doi.org/10.1269/jrr.19.236.

Nishioka H. 1975. Mutagenic activities of metal compounds in bacteria. Mutat Res 31(3):185-189. https://doi.org/10.1016/0165-1161(75)90088-6.

NLM. 2022a. RBC count. MedlinePlus medical encyclopedia. National Library of Medicine. https://medlineplus.gov/ency/article/003644.htm. August 17, 2023.

NLM. 2022b. Reticulocyte count. MedlinePlus medical encyclopedia. National Library of Medicine. https://medlineplus.gov/ency/article/003637.htm. August 18, 2023.

NLM. 2023a. PubChem: Compound summary for cobalt. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/104730. December 8, 2023.

NLM. 2023b. PubChem: Compound summary for cobalt(II) chloride. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/substance/363902174. December 8, 2023.

NLM. 2023c. PubChem: Compound summary for cobalt(II) nitrate. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/25000. December 8, 2023.

NLM. 2023d. PubChem: Compound summary for cobalt(II) oxide. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/14786. December 8, 2023.

NLM. 2023e. PubChem: Compound summary for cobalt tetraoxide. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/substance/470299191. December 8, 2023.

NLM. 2023f. PubChem: Compound summary for cobalt(II) sulfate. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/24965. December 8, 2023.

NLM. 2023g. PubChem: Compound summary for cobalt(II) sulfide. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/14832. December 8, 2023.

NLM. 2023h. PubChem: Compound summary for cobalt arsenide. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/117908. December 8, 2023.

NLM. 2023i. PubChem: Compound summary for cobalt(II) hydroxide. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/substance/470502232. December 8, 2023.

NLM. 2023j. PubChem: Compound summary for cobalt(II) carbonate. National Library of Medicine. https://pubchem.ncbi.nlm.nih.gov/compound/10565. December 8, 2023.

NNDC. 2023. Cobalt. Decay radiation results. National Nuclear Data Center. https://www.nndc.bnl.gov/. October 18, 2023.

NRC. 1981. Evaluation of isotope migration-land burial: Water chemistry at commercially operated low-level radioactive waste disposal sites. Washington, DC: Nuclear Regulatory Commission. NUREG/CR-2124. BNL-NUREG-51383. https://doi.org/10.2172/5063889.

Nriagu JO. 1989. A global assessment of natural sources of atmospheric trace metals. Nature 338:47-49. https://doi.org/10.1038/338047a0.

Nriagu JO. 1992. Toxic metal pollution in Africa. Sci Total Environ 121:1-37. https://doi.org/10.1016/0048-9697(92)90304-b.

Nriagu JO, Coker RD. 1980. Trace metals in humic and fulvic acids from Lake Ontario sediments. Environ Sci Technol 14(4):443-446. https://doi.org/10.1021/es60164a001.

NTP. 1991. NTP report on the toxicity studies of cobalt sulfate heptahydrate in F344/N rats and B6C3F1 mice (inhalation studies). National Institutes of Health, National Toxicology Program. NIH Publication No. 91-3124. https://ntp.niehs.nih.gov/sites/default/files/2023-08/tox05_508.pdf. October 3, 2023.

NTP. 1998. Toxicology and carcinogenesis studies of cobalt sulfate heptahydrate (CAS No. 10026-24-1) in F344/N rats and B6C3F mice (inhalation studies). National Institutes of Health, National Toxicology Program. NIH Publication No. 471. https://ntp.niehs.nih.gov/publications/reports/tr/400s/tr471. December 8, 2023.

NTP. 2013. Draft OHAT approach for systematic review and evidence integration for literature-based health assessments – February 2013. National Toxicology Program, Office of Health Assessment and Translation. https://ntp.niehs.nih.gov/ntp/ohat/evaluationprocess/draftohatapproach_february2013.pdf. May 9, 2022.

NTP. 2014. NTP technical report on the toxicology studies of cobalt metal (CASRN 7440-48-4) in F344/N rats and B6C3F1/N mice and toxicology and carcinogenesis studies of cobalt metal in F344/NTac rats and B6C3F1/N mice (inhalation studies). Research Triangle Park, NC: National Toxicology Program. https://www.ncbi.nlm.nih.gov/books/NBK567171/. December 6, 2023.

NTP. 2015. OHAT risk of bias rating tool for human and animal studies. National Toxicology Program, Office of Health Assessment and Translation. https://ntp.niehs.nih.gov/ntp/ohat/pubs/riskofbiastool_508.pdf. March 19, 2019.

NTP. 2016. Cobalt and cobalt compounds that release cobalt ions in vivo. Report on carcinogens. 14th ed. Research Triangle Park, NC: National Toxicology Program. https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html. December 6, 2023.

NTP. 2018. Cobalt naphthenate (61789-51-3): Genetic toxicology - bacterial mutagenicity. Chemical effects in biological systems (CEBS). Research Triangle Park, NC: National Toxicology Program. https://cebs.niehs.nih.gov/cebs/get_file/accno/13503_16910/file/A28503_G06_Ames_Summary_Data.pdf. February 3, 2024.

NTP. 2021. Cobalt-related exposures. Cobalt and cobalt compounds that release cobalt ions in vivo. In: Report on carcinogens. 15th ed. National Toxicology Program, 1-8. https://ntp.niehs.nih.gov/sites/default/files/ntp/roc/content/profiles/cobalt.pdf. November 22, 2023.

NTP. 2023. Addendum to the report. In: NTP report on the toxicity studies of cobalt sulfate heptahydrate in F344/N rats and B6C3F1 mice (inhalation studies). National Institutes of Health, National Toxicology Program. NIH Publication No. 91-3124. https://ntp.niehs.nih.gov/sites/default/files/2023-08/tox05_508.pdf. February 6, 2024.

Oberdörster G. 1993. Lung dosimetry: Pulmonary clearance of inhaled particles. Aerosol Sci Technol 18(3):279-289. https://doi.org/10.1080/02786829308959605.

OECD. 2018. OECD guideline for the testing of chemicals: repeated dose 90-day oral toxicity study in rodent. Organization for Economic Cooperation and Development. https://www.oecd.org/env/ehs/testing/Revision%20TG%20408%202018.pdf. December 5, 2023.

Ogawa HI, Sakata K, Inouye T, et al. 1986. Combined mutagenicity of cobalt(II) salt and heteroaromatic compounds in Salmonella typhimurium. Mutat Res 172(2):97-104. https://doi.org/10.1016/0165-1218(86)90068-6.

Olivero S, Viallani P, Botta A. 1995. Genotoxic effects of cobalt chloride, sulfate and nitrate on cultured human lymphocytes. Med Sci Res 23:339-341.

Oller AR, Oberdorster G, Seilkop SK. 2014. Derivation of PM10 size-selected human equivalent concentrations of inhaled nickel based on cancer and non-cancer effects on the respiratory tract. Inhal Toxicol 26(9):559-578. https://doi.org/10.3109/08958378.2014.932034.

Omolaoye JA, Uzairu A, Gimba CE. 2010. Heavy metal assessment of some eye shadow products imported into Nigeria from China. Arch Appl Sci Res 2(5):76-84.

Onat B, Caliskan NS, Sahin UA, et al. 2020. Assessment of the health risk related to exposure to ultrafine, fine, and total particulates and metals in a metal finishing plant. Environ Sci Pollut Res Int 27(4):4058-4066. https://doi.org/10.1007/s11356-019-06891-4.

Ondov JM, Zoller WH, Gordon GE. 1982. Trace element emissions on aerosols from motor vehicles. Environ Sci Technol 16:318-328. https://doi.org/10.1021/es00100a004.

O'Neil MJ. 2013. Cobalt. In: The Merck index - An encyclopedia of chemicals, drugs, and biologicals. Cambridge, UK: Royal Society of Chemistry, 434.

Onkelinx C. 1976. Compartment analysis of cobalt (II) metabolism in rats of various ages. Toxicol Appl Pharmacol 38:425-438. https://doi.org/10.1016/0041-008x(76)90149-6.

Onwordi C, Orizu CO, Wusu A, et al. 2011. Potentially toxic metals exposure from body creams sold in Lagos. Researcher 3(1):30-37.

Oria RS, Ben RB, Esomonu UG, et al. 2022. Cobalt exposure triggers impairments in cognitive and anxiety-like behaviors, brain oxidative stress and inflammation, and hippocampo-amygdala histomorphological alterations: Protective role of aqueous Prosopis africana seed extract. Iran J Basic Med Sci 25(12):1528-1536. https://doi.org/10.22038/IJBMS.2022.65689.14456.

OSHA. 2021a. Occupational safety and health standards. Subpart Z - Toxic and hazardous substances. Air contaminants. Table Z-1. Occupational Safety and Health Administration. Code of Federal Regulations. 29 CFR 1910.1000. https://www.govinfo.gov/content/pkg/CFR-2021-title29-vol6/pdf/CFR-2021-title29-vol6-sec1910-1000.pdf. August 28, 2022.

OSHA. 2021b. Occupational safety and health standards for shipyard employment. Subpart Z - Toxic and hazardous substances. Air contaminants. Occupational Safety and Health Administration. Code of Federal Regulations. 29 CFR 1915.1000. https://www.govinfo.gov/content/pkg/CFR-2021-title29-vol7/pdf/CFR-2021-title29-vol7-sec1915-1000.pdf. August 28, 2022.

OSHA. 2021c. Safety and health regulations for construction. Subpart D - Occupational health and environment controls. Gases, vapors, fumes, dusts, and mists. Occupational Safety and Health Administration. Code of Federal Regulations. 29 CFR 1926.55. https://www.govinfo.gov/content/pkg/CFR-2021-title29-vol8/pdf/CFR-2021-title29-vol8-sec1926-55.pdf. August 28, 2022.

Osman D, Cooke A, Young TR, et al. 2021. The requirement for cobalt in vitamin B(12): A paradigm for protein metalation. Biochim Biophys Acta Mol Cell Res 1868(1):118896. https://doi.org/10.1016/j.bbamcr.2020.118896.

Ostapczuk P, Froning M, Stoeppler M, et al. 1985. Square wave voltammetry: A new approach for the sensitive determination of nickel and cobalt in human samples. In: Brown SS, Sunderman FWJ, eds. Progress in nickel toxicology. Oxford: Blackwell Scientific Publications, 129-132.

Ou R, Huang H, He X, et al. 2023. Ecotoxicology of polymetallic nodule seabed mining: The effects of cobalt and nickel on phytoplankton growth and pigment concentration. Toxics 11(12):1005. https://doi.org/10.3390/toxics11121005.

Outridge PM, Noller BN. 1991. Accumulation of toxic trace elements by freshwater vascular plants. Rev Environ Contam Toxicol 121:1-63. https://doi.org/10.1007/978-1-4612-3196-7_1.

Oyagbemi AA, Akinrinde AS, Adebiyi OE, et al. 2020. Luteolin supplementation ameliorates cobalt-induced oxidative stress and inflammation by suppressing NF-κB/Kim-1 signaling in the heart and kidney of rats. Environ Toxicol Pharmacol 80:103488. https://doi.org/10.1016/j.etap.2020.103488.

Pagano DA, Zeiger E. 1992. Conditions for detecting the mutagenicity of divalent metals in Salmonella typhimurium. Environ Mol Mutagen 19(2):139-146. https://doi.org/10.1002/em.2850190208.

Painter RB, Howard R. 1982. The HeLa DNA-synthesis inhibition test as a rapid screen for mutagenic carcinogens. Mutat Res 92:427-437. https://doi.org/10.1016/0027-5107(82)90241-X.

Paley KR, Sobel ES, Yalow RS. 1958. Effect of oral and intravenous cobaltous chloride on thyroid function. J Clin Endocrinol Metab 18(8):850-859. https://doi.org/10.1210/jcem-18-8-850.

Palit S, Ghosh AK, Sharma A, et al. 1991a. Modification of the clastogenic effects of cobalt by calcium in bone marrow cells of mice in vivo. Cytologia (Tokyo) 56:373-377.

Palit S, Sen S, Sharma A, et al. 1991b. Protection by chlorophyllin against induction of chromosomal aberrations by cobalt in bone marrow cells of mice in vivo. Fitoterapia 62(5):425-428.

Palit S, Sharma A, Talukder G. 1991c. Cytotoxic effects of cobalt chloride on mouse bone marrow cells in vivo. Cytobios 68(273):85-89.

Palit S, Sharma A, Talukder G. 1991d. Chromosomal aberrations induced by cobaltous chloride in mice in vivo. Biol Trace Elem Res 29(2):139-145. https://doi.org/10.1007/BF03032691.

Palmes ED, Nelson N, Laskin S, et al. 1959. Inhalation toxicity of cobalt hydrocarbonyl. Am Ind Hyg Assoc J 20:453-468. https://doi.org/10.1080/00028895909343751.

Pappas RS, Stanfill SB, Watson CH, et al. 2008. Analysis of toxic metals in commercial moist snuff and Alaskan Iqmik. J Anal Toxicol 32(4):281-291. https://doi.org/10.1093/jat/32.4.281.

Paternain JL, Domingo JL. 1988. Developmental toxicity of cobalt in the rat. J Toxicol Environ Health 24:193-200. https://doi.org/10.1080/15287398809531153.

Paton GR, Allison AC. 1972. Chromosome damage in human cell cultures induced by metal salts. Mutat Res 16(3):332-336. https://doi.org/10.1016/0027-5107(72)90166-2.

Patrick G, Batchelor AL, Stirling C. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles- Part VI: Lung clearance of inhaled cobalt oxide particles in SPF Fischer rats. J Aerosol Sci 20(2):249-255. https://doi.org/10.1016/0021-8502(89)90047-5.

Paustenbach DJ, Tvermoes BE, Unice KM, et al. 2013. A review of the health hazards posed by cobalt. Crit Rev Toxicol 43(4):316-362. https://doi.org/10.3109/10408444.2013.779633.

Pazzaglia UE, Apostoli P, Congiu T, et al. 2011. Cobalt, chromium and molybdenum ions kinetics in the human body: data gained from a total hip replacement with massive third body wear of the head and neuropathy by cobalt intoxication. Arch Orthop Trauma Surg 131(9):1299-1308. https://doi.org/10.1007/s00402-011-1268-7.

Pedigo NG, Vernon MW. 1993. Embryonic losses after 10-week administration of cobalt to male mice. Reprod Toxicol 7(2):111-116. https://doi.org/10.1016/0890-6238(93)90244-2.

Pedigo NG, George WJ, Anderson MB. 1988. Effects of acute and chronic exposure to cobalt on male reproduction in mice. Reprod Toxicol 2(1):45-53. https://doi.org/10.1016/s0890-6238(88)80008-x.

Pehrsson SK, Hatori N, Clyne N, et al. 1991. The effect of chronic cobalt exposure on cardiac function in rats. Trace Elem Med 8(4):195-198.

Pereira PSC, Mendes LC, Dias ML, et al. 2007. Influence of cobalt complex on thermal properties of poly(ethylene terephthalate)/polycarbonate blend. J Therm Anal Calorim 87(3):667-671. https://doi.org/10.1007/s10973-006-7873-y.

Persson B, Carlenor E, Clyne N, et al. 1992. Binding of dietary cobalt to sarcoplasmic reticulum proteins. Scand J Clin Lab Invest 52(2):137-140. https://doi.org/10.3109/00365519209088777.

Petrova E, Pavlova E, Tinkov AA, et al. 2020. Cobalt accumulation and iron-regulatory protein profile expression in immature mouse brain after perinatal exposure to cobalt chloride. Chem Biol Interact 329:109217. https://doi.org/10.1016/j.cbi.2020.109217.

Ponti J, Sabbioni E, Munaro B, et al. 2009. Genotoxicity and morphological transformation induced by cobalt nanoparticles and cobalt chloride: an in vitro study in Balb/3T3 mouse fibroblasts. Mutagenesis 24(5):439-445. https://doi.org/10.1093/mutage/gep027.

Potolicchio I, Mosconi G, Forni A, et al. 1997. Susceptibility to hard metal lung disease is strongly associated with the presence of glutamate 69 in HLA-DPbeta chain. Eur J Immunol 27:2741-2743. https://doi.org/10.1002/eji.1830271039.

Potolicchio I, Festucci A, Hausler P, et al. 1999. HLA-DP molecules bind cobalt: a possible explanation for the genetic association with hard metal disease. Eur J Immunol 29(7):2140-2147. https://doi.org/10.1002/(SICI)1521-4141(199907)29:07<2140::AID-IMMU2140>3.0.CO;2-Q.

Prazmo W, Balbin E, Baranowska H, et al. 1975. Manganese mutagenesis in yeast. II. Conditions of induction and characteristics of mitochondrial respiratory deficient Saccharomyces cerevisiae mutants induced with manganese and cobalt. Genet Res 26(1):21-29. https://doi.org/10.1017/s0016672300015810.

Prentice JR, Blackwell CS, Raoof N, et al. 2014. Auditory and visual health after ten years of exposure to metal-on-metal hip prostheses: a cross-sectional study follow up. PLoS One 9(3):e90838. https://doi.org/10.1371/journal.pone.0090838.

Prescott E, Netterstrom B, Faber J, et al. 1992. Effect of occupational exposure to cobalt blue dyes on the thyroid volume and function of female plate painters. Scand J Work Environ Health 18(2):101-104. https://doi.org/10.5271/sjweh.1605.

Procter and Gamble. 1995. TSCA Section 8(e) submission for several NTP test substances. The Procter & Gamble Company. Submitted to the U.S. Environmental Protection Agency under TSCA Section 8E. 8EHQ-0895-13500. 88950000284. https://chemview.epa.gov/proxy?filename=8e%2F88950000284_No%20CAS%20Number_7996CA6C319473968525693000 4D6688.pdf. December 6, 2023.

Raffin E, Mikkelsen S, Altman DG, et al. 1988. Health effects due to occupational exposure to cobalt blue dye among plate painters in a porcelain factory in Denmark. Scand J Work Environ Health 14:378-384. https://doi.org/10.5271/sjweh.1903.

Rasgele PG, Kekecoglu M, Muranli FDG. 2013. Induction of micronuclei in mice bone marrow cells by cobalt and copper chlorides. Arch Environ Protect 39(1):75-82. https://doi.org/10.2478/aep-2013-0007.

Redhammer GJ, Koll L, Bernroider M, et al. 2007. Co^{2+}-Cu^{2+} substitution in bieberite solid-solution series, $(Co_{1-x}Cu_x)SO4{\cdot}7H_2O$, $0.00 \leq x \leq 0.46$: Synthesis, single-crystal structure analysis, and optical spectroscopy. Am Mineral 92(4):532-545. https://doi.org/10.2138/am.2007.2229.

Rehfisch P, Anderson M, Berg P, et al. 2012. Lung function and respiratory symptoms in hard metal workers exposed to cobalt. J Occup Environ Med 54(4):409-413. https://doi.org/10.1097/JOM.0b013e31824d2d7e.

Reimann C, de Caritat P, Halleraker JH, et al. 1997. Rainwater composition in eight arctic catchments in northern Europe (Finland, Norway, and Russia). Atmos Environ 31(2):159-170. https://doi.org/10.1016/1352-2310(96)00197-5.

Ren M, Yan L, Pang Y, et al. 2020. External interference from ambient air pollution on using hair metal(loid)s for biomarker-based exposure assessment. Environ Int 137:105584. https://doi.org/10.1016/j.envint.2020.105584.

RePORTER. 2023. Cobalt. Research Portfolio Online Reporting Tools. National Institutes of Health. https://reporter.nih.gov/. January 19, 2023.

Reuber S, Kreuzer M, Kirchgessner M. 1994. Interactions of cobalt and iron in absorption and retention. J Trace Elem Electrolytes Health Dis 8(3-4):151-158.

Richardson JB, Dancy BCR, Horton CL, et al. 2018. Exposure to toxic metals triggers unique responses from the rat gut microbiota. Sci Rep 8(1):6578. https://doi.org/10.1038/s41598-018-24931-w.

Richter B, Lohle E, Knapp B, et al. 2002. Harmful substances on the opera stage: possible negative effects on singers' respiratory tracts. J Voice 16(1):72-80. https://doi.org/10.1016/s0892-1997(02)00074-7.

Roche M, Layrisse M. 1956. Effect of cobalt on thyroidal uptake of I131. J Clin Endocrinol Metabol 16(6):831-833. https://doi.org/10.1210/jcem-16-6-831.

Rogkotis K, Matsia S, Likotrafiti E, et al. 2022. Selective antimicrobial food packaging of composite poly(lactic acid) cobalt-citrate films. Food Packag Shelf Life 34 https://doi.org/10.1016/j.fpsl.2022.100959.

Romaguera C, Vilaplana J. 1998. Contact dermatitis in children: 6 years experience (1992-1997). Contact Dermatitis 39(6):277-280. https://doi.org/10.1111/j.1600-0536.1998.tb05941.x.

Rooney AA, Boyles AL, Wolfe MS, et al. 2014. Systematic review and evidence integration for literature-based environmental health science assessments. Environ Health Perspect 122(7):711-718. https://doi.org/10.1289/ehp.1307972.

Rosenberg DW. 1993. Pharmacokinetics of cobalt chloride and cobalt-protoporphyrin. Drug Metab Dispos 21(5):846-849.

Rossman TG, Molina M, Meyer LW. 1984. The genetic toxicology of metal compounds: I. Induction of λ prophage in E coli WP2s(λ). Environ Mutagen 6(1):59-69. https://doi.org/10.1002/em.2860060108.

Roto P. 1980. Asthma, symptoms of chronic bronchitis and ventilatory capacity among cobalt and zinc production workers. Scand J Work Environ Health 6(Suppl 1):1-49. https://doi.org/10.5271/sjweh.2641.

Ruiz P, Ray M, Fisher J, et al. 2011. Development of a human physiologically based pharmacokinetic (PBPK) toolkit for environmental pollutants. Int J Mol Sci 12(11):7469-7480. https://doi.org/10.3390/ijms12117469.

Rystedt I, Fisher T. 1983. Relationship between nickel and cobalt sensitization in hard metal workers. Contact Dermatitis 9:195-200. https://doi.org/10.1111/j.1600-0536.1983.tb04357.x.

Sainio EL, Jolanki R, Hakala E, et al. 2000. Metals and arsenic in eye shadows. Contact Dermatitis 42(1):5-10. https://doi.org/10.1034/j.1600-0536.2000.042001005.x.

Saker F, Ybarra J, Leahy P, et al. 1998. Glycemia-lowering effect of cobalt chloride in the diabetic rat: role of decreased gluconeogenesis. Am J Physiol 274(6):E984-991. https://doi.org/10.1152/ajpendo.1998.274.6.E984.

Salami AT, Oyagbemi AA, Alabi MV, et al. 2023. Naringenin modulates cobalt activities on gut motility through mechanosensors and serotonin signalling. Biomarkers 28(1):11-23. https://doi.org/10.1080/1354750x.2022.2137235.

Sauni R, Linna A, Oksa P, et al. 2010. Cobalt asthma-a case series from a cobalt plant. Occup Med (Lond) 60(4):301-306. https://doi.org/10.1093/occmed/kqq023.

Sauni R, Oksa P, Uitti J, et al. 2017. Cancer incidence among Finnish male cobalt production workers in 1969-2013: a cohort study. BMC Cancer 17(1):340. https://doi.org/10.1186/s12885-017-3333-2.

Scansetti G, Lamon S, Talarico S, et al. 1985. Urinary cobalt as a measure of exposure in the hard metal industry. Int Arch Occup Environ Health 57:19-26. https://doi.org/10.1007/BF00383542.

Scansetti G, Botta GC, Spinelli P, et al. 1994. Absorption and excretion of cobalt in the hard metal industry. Sci Total Environ 150(1-3):141-144. https://doi.org/10.1016/0048-9697(94)90141-4.

Schade SG, Felsher BF, Bernier GM, et al. 1970. Interrelationship of cobalt and iron absorption. J Lab Clin Med 75(3):435-441. https://doi.org/10.5555/uri:pii:0022214370901162.

Schnitzer M. 1969. Reactions between fulvic acid, a soil humic compound and inorganic soil constituents. Soil Sci Soc Am J 33(1):75-81. https://doi.org/10.2136/sssaj1969.03615995003300010022x.

Schroeder WH, Dobson M, Kane DM, et al. 1987. Toxic trace elements associated with airborne particulate matter: a review. JAPCA 37(11):1267-1285. https://doi.org/10.1080/08940630.1987.10466321.

Sederholm T, Kouvalainen K, Lamberg B-A. 1968. Cobalt-induced hypothyroidism and polycythemia in lipoid nephrosis. Acta Med Scand 184(4):301-306. https://doi.org/10.1111/j.0954-6820.1968.tb02462.x.

Seidenberg JM, Anderson DG, Becker RA. 1986. Validation of an in vivo developmental toxicity screen in the mouse. Teratog Carcinog Mutagen 6(5):361-374. https://doi.org/10.1002/tcm.1770060503.

Selden AI, Norberg C, Karlson-Stiber C, et al. 2007. Cobalt release from glazed earthenware: Observations in a case of lead poisoning. Environ Toxicol Pharmacol 23(1):129-131. https://doi.org/10.1016/j.etap.2006.07.002.

Sesana G, Cortona G, Baj A, et al. 1994. Cobalt exposure in wet grinding of hard metal tools for wood manufacture. Sci Total Environ 150(1-3):117-119. https://doi.org/10.1016/0048-9697(94)90137-6.

Sheets RW. 1998. Release of heavy metals from European and Asian porcelain dinnerware. Sci Total Environ 212(2-3):107-113. https://doi.org/10.1016/s0048-9697(97)00315-x.

Sheline GE, Chaikoff IL, Montgomery ML. 1946. The elimination of administered cobalt in pancreatic juice and bile of the dog, as measured with its radioactive isotopes. Am J Physiol 145:285-290. https://doi.org/10.1152/ajplegacy.1946.145.3.285.

Shen M, Ren M, Wang Y, et al. 2021. Identifying dust as the dominant source of exposure to heavy metals for residents around battery factories in the Battery Industrial Capital of China. Sci Total Environ 765:144375. https://doi.org/10.1016/j.scitotenv.2020.144375.

Shine JP, Ika RV, Ford TE. 1995. Multivariate statistical examination of spatial and temporal patterns of heavy metal contamination in New Bedford Harbor marine sediments. Environ Sci Technol 29(7):1781-1788. https://doi.org/10.1021/es00007a014.

Shirakawa T, Kusaka Y, Fujimura N, et al. 1988. The existence of specific antibodies to cobalt in hard metal asthma. Clin Allergy 18(5):451-460. https://doi.org/10.1111/j.1365-2222.1988.tb02895.x.

Shirakawa T, Kusaka Y, Fujimura N, et al. 1989. Occupational asthma from cobalt sensitivity in workers exposed to hard metal dust. Chest 95(1):29-37. https://doi.org/10.1378/chest.95.1.29.

Shiue I, Bramley G. 2015. Environmental chemicals mediated the effect of old housing on adult health problems: US NHANES, 2009-2010. Environ Sci Pollut Res Int 22(2):1299-1308. https://doi.org/10.1007/s11356-014-3468-5.

Shrivastava VK, David CV, Khare N, et al. 1996. Cobalt chloride induced histopathological changes in thyroid gland of female mice, Mus musculus (p.). Pollut Res 15(3):307-309.

Shrivastava K, Ram MS, Bansal A, et al. 2008. Cobalt supplementation promotes hypoxic tolerance and facilitates acclimatization to hypobaric hypoxia in rat brain. High Alt Med Biol 9(1):63-75. https://doi.org/10.1089/ham.2008.1046.

Shrivastava K, Bansal A, Singh B, et al. 2010. Sub-chronic oral toxicity study in Sprague-Dawley rats with hypoxia mimetic cobalt chloride towards the development of promising neutraceutical for oxygen deprivation. Exp Toxicol Pathol 62(5):489-496. https://doi.org/10.1016/j.etp.2009.06.012.

Simesen M. 1939. The fate of cobalt after oral administration of metallic cobalt and subcutaneous injection of carbonatotetraminecobalt chloride, with remarks on the quantitative estimation of cobalt in organic materials. Arch Int Pharmacodyn 62:347-356.

Singh I. 1983. Induction of reverse mutation and mitotic gene conversion by some metal compounds in Saccharomyces cerevisiae. Mutat Res 117:149-152. https://doi.org/10.1016/0165-1218(83)90162-3.

Singh PP, Junnarkar AY. 1991. Behavioural and toxic profile of some essential trace metal salts in mice and rats. Indian J Pharmacol 23:153-159.

Skalny AV, Gluhcheva Y, Ajsuvakova OP, et al. 2021. Perinatal and early-life cobalt exposure impairs essential metal metabolism in immature ICR mice. Food Chem Toxicol 149:111973. https://doi.org/10.1016/j.fct.2021.111973.

Smith IC, Carson BL. 1981. Volume 6 - cobalt: An appraisal of environmental exposure. In: Trace metals in the environment. Ann Arbor, MI: Ann Arbor Science Publishers, 1-62, 85-88, 383, 389, 394-395, 406-491, 531-562, 777-924.

Smith T, Edmonds CJ, Barnaby CF. 1972. Absorption and retention of cobalt in man by whole-body counting. Health Phys 22(4):359-367. https://doi.org/10.1097/00004032-197204000-00007.

Smith LJ, Holmes AL, Kandpal SK, et al. 2014. The cytotoxicity and genotoxicity of soluble and particulate cobalt in human lung fibroblast cells. Toxicol Appl Pharmacol 278(3):259-265. https://doi.org/10.1016/j.taap.2014.05.002.

Sneyers L, Verheyen L, Vermaercke P, et al. 2009. Trace element determination in beauty products by k_0-instrumental neutron activation analysis. J Radioanal Nucl Chem 281(2):259-263. https://doi.org/10.1007/s10967-009-0105-8.

Sorbie J, Olatunbosun D, Corbett WE, et al. 1971. Cobalt excretion test for the assessment of body iron stores. Can Med Assoc J 104(9):777-782.

Sovacool BK, Ali SH, Bazilian M, et al. 2020. Sustainable minerals and metals for a low-carbon future. Science 367(6473):30-33. https://doi.org/10.1126/science.aaz6003.

Speijers GJ, Krajnc EI, Berkvens JM, et al. 1982. Acute oral toxicity of inorganic cobalt compounds in rats. Food Chem Toxicol 20(3):311-314. https://doi.org/10.1016/s0278-6915(82)80298-6.

Sprince NL, Oliver LC, Eisen EA, et al. 1988. Cobalt exposure and lung disease in tungsten carbide production. A cross-sectional study of current workers. Am Rev Respir Dis 138(5):1220-1226. https://doi.org/10.1164/ajrccm/138.5.1220.

Stanley AJ, Hopps HC, Shideler AM. 1947. Cobalt polycythemia. II. Relative effects of oral and subcutaneous administration of cobaltous chloride. Proc Soc Exp Biol Med 66:19-20. https://doi.org/10.3181/00379727-66-15968.

Stebbins AI, Horstman SW, Daniell WE, et al. 1992. Cobalt exposure in a carbide tip grinding process. Am Ind Hyg Assoc J 53(3):186-192. https://doi.org/10.1080/15298669291359492.

Suh M, Casteel S, Dunsmore M, et al. 2019. Bioaccessibility and relative oral bioavailability of cobalt and nickel in residential soil and dust affected by metal grinding operations. Sci Total Environ 660:677-689. https://doi.org/10.1016/j.scitotenv.2018.12.317.

Sullivan JF, Egan JD, George RP. 1969. A distinctive myocardiopathy occurring in Omaha, Nebraska: clinical aspects. Ann N Y Acad Sci 156(1):526-543. https://doi.org/10.1111/j.1749-6632.1969.tb16749.x.

Sun W, Feng L, Zhang J, et al. 2022. Amidoxime group-anchored single cobalt atoms for anti-biofouling during uranium extraction from seawater. Adv Sci (Weinh) 9(10):e2105008. https://doi.org/10.1002/advs.202105008.

Sundaram P, Agrawal K, Mandke JV, et al. 2001. Giant cell pneumonitis induced by cobalt. Indian J Chest Dis Allied Sci 43(1):47-49.

Sunderman FW, Hopfer SM, Swift T, et al. 1989. Cobalt, chromium, and nickel concentrations in body fluids of patients with porous-coated knee or hip prostheses. J Orthop Res 7(3):307-315. https://doi.org/10.1002/jor.1100070302.

Suzuki Y, Shimizu H, Nagae Y, et al. 1993. Micronucleus test and erythropoiesis: effect of cobalt on the induction of micronuclei by mutagens. Environ Mol Mutagen 22(2):101-106. https://doi.org/10.1002/em.2850220208.

Svartengren M, Bryngelsson IL, Marsh G, et al. 2017. Cancer incidence among hardmetal production workers: The Swedish cohort. J Occup Environ Med 59(12):e365-e373. https://doi.org/10.1097/JOM.0000000000001185.

Sweeney LM, Gearhart JM. 2020. Examples of physiologically based pharmacokinetic modeling applied to risk assessment. In: Fisher JW, Gearhart JM, Lin Z, eds. Physiologically based pharmacokinetic (PBPK) modeling. Academic Press: 281-299. https://doi.org/10.1016/B978-0-12-818596-4.00011-4.

Swennen B, Buchet JP, Stanescu D, et al. 1993. Epidemiological survey of workers exposed to cobalt oxides, cobalt salts, and cobalt metal. Br J Ind Med 50(9):835-842. https://doi.org/10.1136/oem.50.9.835.

Szakmary E, Ungvary G, Hudak A, et al. 2001. Effects of cobalt sulfate on prenatal development of mice, rats, and rabbits, and on early postnatal development of rats. J Toxicol Environ Health A 62(5):367-386. https://doi.org/10.1080/152873901300018110.

Szefer P, Pempkowiak J, Skwarzec B, et al. 1993. Concentration of selected metals in penguins and other representative fauna of the Antarctica. Sci Total Environ 138(1-3):281-288. https://doi.org/10.1016/0048-9697(93)90421-2.

Szefer P, Szefer K, Glasby GP, et al. 1996. Heavy-metal pollution in surficial sediments from the Southern Baltic Sea off Poland. J Environ Sci Health A31(10):2723-2754. https://doi.org/10.1080/10934529609376520.

Takaya Y, Kuwaba S, Tsujimura Y, et al. 2023. Chemical speciation changes of an all-solid-state lithium-ion battery caused by roasting determined by sequential acid leaching. Waste Manag 166:122-132. https://doi.org/10.1016/j.wasman.2023.04.042.

Talbot RJ, Morgan A. 1989. An interspecies comparison of the lung clearance of inhaled monodisperse cobalt oxide particles-Part VIII: Lung clearance of inhaled cobalt oxide particles in mice. J Aerosol Sci 20(2):261-265.

Tan YM, Chan M, Chukwudebe A, et al. 2020. PBPK model reporting template for chemical risk assessment applications. Regul Toxicol Pharmacol 115:104691. https://doi.org/10.1016/j.yrtph.2020.104691.

Tanoğlu C, Ersoy A, Coban TA, et al. 2022. The effect of taxifolin on oxidative sciatic nerve damage induced by cobalt chloride in rats: a biochemical and histopathological evaluation. Acta Neurobiol Exp (Wars) 82(3):254-262. https://doi.org/10.55782/ane-2022-024.

Taylor DM. 1962. The absorption of cobalt from the gastro-intestinal tract of the rat. Phys Med Biol 6:445-451. https://doi.org/10.1088/0031-9155/6/3/308.

Taylor A, Marks V, Shabaan AA, et al. 1977. Cobalt induced lipaemia and erythropoiesis. Dev Toxicol Environ Sci 1:105-108.

Teraoka H. 1981. Distribution of 24 elements in the internal organs of normal males and the metallic workers in Japan. Arch Environ Health 36(4):155-165. https://doi.org/10.1080/00039896.1981.10667620.

Thomas RG, Furchner JE, London JE, et al. 1976. Comparative metabolism of radionuclides in mammals-X. Retention of tracer-level cobalt in the mouse, rat, monkey and dog. Health Phys 31(4):323-333. https://doi.org/10.1097/00004032-197610000-00003.

Thomson AB, Valberg LS, Sinclair DG. 1971. Competitive nature of the intestinal transport mechanism for cobalt and iron in the rat. J Clin Invest 50(11):2384-2394. https://doi.org/10.1172/JCI106737.

Thyssen JP, Menne T, Johansen JD, et al. 2010. A spot test for detection of cobalt release - early experience and findings. Contact Dermatitis 63(2):63-69. https://doi.org/10.1111/j.1600-0536.2010.01749.x.

Thyssen JP, Menne T, Liden C, et al. 2011. Cobalt release from implants and consumer items and characteristics of cobalt sensitized patients with dermatitis. Contact Dermatitis 66(3):113-122. https://doi.org/10.1111/j.1600-0536.2011.02001.x.

Thyssen JP, Johansen JD, Jellesen MS, et al. 2013. Consumer leather exposure: an unrecognized cause of cobalt sensitization. Contact Dermatitis 69(5):276-279. https://doi.org/10.1111/cod.12101.

Tipping E, Lofts S, Lawlor AJ. 1998. Modelling the chemical speciation of trace metals in the surface waters of the Humber system. Sci Total Environ 210-211(1-6):63-77. https://doi.org/10.1016/s0048-9697(98)00045-x.

Toste AP, Kirby LJ, Pahl TR. 1984. Role of organics in the subsurface migration of radionuclides in groundwater. In: Barney GS, Navratil JD, Schulz WW, eds. Geochemical behavior of disposed radioactive waste. Washington, DC: American Chemical Society, 251-270.

TRI22. 2024. Cobalt. TRI explorer: release reports. Washington, DC: Toxics Release Inventory. U.S. Environmental Protection Agency. https://enviro.epa.gov/triexplorer/tri_release.chemical. May 29, 2024.

Tso WW, Fung WP. 1981. Mutagenicity of metallic cations. Toxicol Lett 8(4-5):195-200. https://doi.org/10.1016/0378-4274(81)90100-4.

Tüchsen F, Jensen MV, Villadsen E, et al. 1996. Incidence of lung cancer among cobalt-exposed women. Scand J Work Environ Health 22(6):444-450. https://doi.org/10.5271/sjweh.166.

Tvermoes BE, Finley BL, Unice KM, et al. 2013. Cobalt whole blood concentrations in healthy adult male volunteers following two-weeks of ingesting a cobalt supplement. Food Chem Toxicol 53:432-439. https://doi.org/10.1016/j.fct.2012.11.033.

Tvermoes BE, Unice KM, Paustenbach DJ, et al. 2014. Effects and blood concentrations of cobalt after ingestion of 1 mg/d by human volunteers for 90 d. Am J Clin Nutr 99(3):632-646. https://doi.org/10.3945/ajcn.113.071449.

Tvermoes BE, Paustenbach DJ, Kerger BD, et al. 2015. Review of cobalt toxicokinetics following oral dosing: Implications for health risk assessments and metal-on-metal hip implant patients. Crit Rev Toxicol 45(5):367-387. https://doi.org/10.3109/10408444.2014.985818.

Uboldi C, Orsiere T, Darolles C, et al. 2016. Poorly soluble cobalt oxide particles trigger genotoxicity via multiple pathways. Part Fibre Toxicol 13:5. https://doi.org/10.1186/s12989-016-0118-8.

Ude CC, Schmidt SJ, Laurencin S, et al. 2023. Hyaluronic acid-British anti-Lewisite as a safer chelation therapy for the treatment of arthroplasty-related metallosis. Proc Natl Acad Sci U S A 120(45):e2309156120. https://doi.org/10.1073/pnas.2309156120.

Umar AH, Suleiman I, Muhammad H. 2016. Effect of low dose lead (Pb) administration on tail immersion test and formalin-induced pain in Wistar rats: Possible modulatory role of cobalt (II) chloride. Niger J Physiol Sci 31(2):161-164.

Unice KM, Monnot AD, Gaffney SH, et al. 2012. Inorganic cobalt supplementation: prediction of cobalt levels in whole blood and urine using a biokinetic model. Food Chem Toxicol 50(7):2456-2461. https://doi.org/10.1016/j.fct.2012.04.009.

Unice KM, Kerger BD, Paustenbach DJ, et al. 2014a. Refined biokinetic model for humans exposed to cobalt dietary supplements and other sources of systemic cobalt exposure. Chem Biol Interact 216:53-74. https://doi.org/10.1016/j.cbi.2014.04.001.

Unice KM, Kerger BD, Paustenbach DJ, et al. 2014b. Supplemental material: Refined biokinetic model for humans exposed to cobalt dietary supplements and other sources of systemic cobalt exposure. Chem Biol Interact 216 https://doi.org/10.1016/j.cbi.2014.04.001.

Unice KM, Kovochich M, Monnot AD. 2020a. Cobalt-containing dust exposures: Prediction of whole blood and tissue concentrations using a biokinetic model. Sci Total Environ 723:137968. https://doi.org/10.1016/j.scitotenv.2020.137968.

Unice KM, Kovochich M, Monnot AD. 2020b. Supplemental material: Cobalt-containing dust exposures: Prediction of whole blood and tissue concentrations using a biokinetic model. Sci Total Environ 723 https://doi.org/10.1016/j.scitotenv.2020.137968.

UNSCEAR. 2011. Sources and effects of ionizing radiation: Volume II: Annexes C: Radiation exposure in accidents. New York, NY: United Nations Scientific Committee on the Effects of Atomic Radiation. 1-44. https://www.unscear.org/unscear/uploads/documents/unscear-reports/UNSCEAR_2008_Report_Vol.II.pdf. December 5, 2023.

USC. 2011. The public health and welfare. Hazardous air pollutants. United States Code. 42 USC 7412. https://www.govinfo.gov/app/details/USCODE-2011-title42/USCODE-2011-title42-chap85-subchapI-partA-sec7412. February 15, 2024.

USGS. 2006. Determination of elements in natural-water, biota, sediment, and soil samples using collision/reaction cell inductively coupled plasma-mass spectrometry. Chapter 1. Section B, methods of the National Water Quality Laboratory. Book 5, laboratory analysis. Reston, VA: U.S. Geological Survey. Techniques and Methods 5-B1. https://pubs.usgs.gov/tm/2006/tm5b1/https://pubs.usgs.gov/tm/2006/tm5b1/. December 8, 2023.

USGS. 2011. Cobalt - for strength and color. U.S. Geological Survey. Fact sheet 2011-3081. https://pubs.usgs.gov/fs/2011/3081/pdf/fs2011-3081.pdf. December 6, 2023.

USGS. 2017. Cobalt. Chapter F of critical mineral resources of the United States - Economic and environmental geology and prospects for future supply. Reston, VA: U.S. Geological Survey. Professional paper 1802-F. https://doi.org/10.3133/pp1802.

USGS. 2019. 2016 Minerals yearbook: Cobalt [advance release]. U.S. Geological Survey. https://www.usgs.gov/centers/national-minerals-information-center/cobalt-statistics-and-information. December 8, 2023.

USGS. 2020. Cobalt. Mineral commodity summary. U.S. Geological Survey. https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-cobalt.pdf. December 6, 2023.

USGS. 2023. Cobalt. Mineral commodity summaries 2023. U.S. Geological Survey. https://pubs.usgs.gov/periodicals/mcs2023/mcs2023-cobalt.pdf. December 6, 2023.

Valberg LS, Ludwig J, Olatunbosun D. 1969. Alteration in cobalt absorption in patients with disorders of iron metabolism. Gastroenterology 56(2):241-251. https://doi.org/10.1016/S0016-5085(69)80123-X.

Van Bruwaene R, Gerber GB, Kirchmann R, et al. 1984. Metabolism of ^{51}Cr, ^{54}Mn, ^{59}Fe and ^{60}Co in lactating dairy cows. Health Phys 46(5):1069-1082. https://doi.org/10.1097/00004032-198405000-00007.

Van Campenhout E. 1955. The cytotoxic effect of cobalt salts on the alpha cells of the Islands of Langerhans. J Exp Zool 124:535-559. https://doi.org/10.1002/jez.1401290306.

van den Brule S, Ibouraadaten S, Brombin L, et al. 2022. A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 2a: Grouping cobalt compounds based on their capacity to stabilize HIF-1α in human alveolar epithelial cells in vitro. Regul Toxicol Pharmacol 130:105121. https://doi.org/10.1016/j.yrtph.2022.105121.

Van Goethem F, Lison D, Kirsch-Volders M. 1997. Comparative evaluation of the in vitro micronucleus test and the alkaline single cell gel electrophoresis assay for the detection of DNA damaging agents:

genotoxic effects of cobalt powder, tungsten carbide and cobalt-tungsten carbide. Mutat Res 392(1-2):31-43. https://doi.org/10.1016/s0165-1218(97)00043-8.

Vassilev PP, Venkova K, Pencheva N, et al. 1993. Changes in the contractile responses to carbachol and in the inhibitory effects of verapamil and nitrendipine on isolated smooth muscle preparations from rats subchronically exposed to Co 2+ and Ni 2+. Arch Toxicol 67:330-337. https://doi.org/10.1007/BF01973704.

Veien NK, Hattel T, Justesen O, et al. 1987. Oral challenge with nickel and cobalt in patients with positive patch tests to nickel and/or cobalt. Acta Derm Venereol 67:321-325. https://doi.org/10.2340/0001555567321325.

Verougstraete V, Mallants A, Buchet JP, et al. 2004. Lung function changes in workers exposed to cobalt compounds: a 13-year follow-up. Am J Respir Crit Care Med 170(2):162-166. https://doi.org/10.1164/rccm.200310-1357OC.

Verougstraete V, Danzeisen R, Viegas V, et al. 2022. A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 1: Bioaccessibility testing. Regul Toxicol Pharmacol 129:105124. https://doi.org/10.1016/j.yrtph.2022.105124.

Viegas V. 2023. Additional information in support of Danzeisen et al. 2020a, doi: 10.1093/toxsci/kfz249. Written communication (September 1) between V. Viegas, Cobalt Institute and K. Zaccaria, SRC, Inc.

Viegas V. 2024. Additional information in support of Viegas et al. 2022a, doi: 10.1016/j.yrtph.2022.105127. Written communication (January 28) between V. Viegas, Cobalt Institute and K. Zaccaria, SRC, Inc.

Viegas V, Burzlaff A, Brock TO, et al. 2022a. A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 3: Inflammatory response following acute inhalation exposure correlates with lower tier data. Regul Toxicol Pharmacol 130:105127. https://doi.org/10.1016/j.yrtph.2022.105127.

Viegas V, Burzlaff A, Brock TO, et al. 2022b. Supplemental material: A tiered approach to investigate the inhalation toxicity of cobalt substances. Tier 3: Inflammatory response following acute inhalation exposure correlates with lower tier data. Regul Toxicol Pharmacol 130 https://doi.org/10.1016/j.yrtph.2022.105127.

Vilaplana J, Grimalt F, Romaguera C, et al. 1987. Cobalt content of household cleaning products. Contact Dermatitis 16(3):139-141. https://doi.org/10.1111/j.1600-0536.1987.tb01407.x.

Wahlberg JE, Liden C. 2000. Cross-reactivity patterns of cobalt and nickel studied with repeated open applications (ROATS) to the skin of guinea pigs. Am J Contact Dermat 11(1):42-48. https://doi.org/10.1016/s1046-199x(00)90031-9.

Wahlqvist F, Bryngelsson IL, Westberg H, et al. 2020. Dermal and inhalable cobalt exposure-Uptake of cobalt for workers at Swedish hard metal plants. PLoS One 15(8):e0237100. https://doi.org/10.1371/journal.pone.0237100.

Wallner P, Kundi M, Moshammer H, et al. 2017. Mortality among hardmetal production workers: A retrospective cohort study in the Austrian hardmetal industry. J Occup Environ Med 59(12):e282-e287. https://doi.org/10.1097/JOM.0000000000001046.

Walters GI, Moore VC, Robertson AS, et al. 2012. An outbreak of occupational asthma due to chromium and cobalt. Occup Med (Lond) 62(7):533-540. https://doi.org/10.1093/occmed/kqs111.

Walters GI, Robertson AS, Moore VC, et al. 2014. Cobalt asthma in metalworkers from an automotive engine valve manufacturer. Occup Med (Lond) 64(5):358-364. https://doi.org/10.1093/occmed/kqu043.

Wan R, Mo Y, Zhang Z, et al. 2017. Cobalt nanoparticles induce lung injury, DNA damage and mutations in mice. Part Fibre Toxicol 14(1):38. https://doi.org/10.1186/s12989-017-0219-z.

Wang Z, Chen Z, Zuo Q, et al. 2013. Reproductive toxicity in adult male rats following intra-articular injection of cobalt-chromium nanoparticles. J Orthop Sci 18(6):1020-1026. https://doi.org/10.1007/s00776-013-0458-2.

Wang B, Su Y, Tian L, et al. 2020. Heavy metals in face paints: Assessment of the health risks to Chinese opera actors. Sci Total Environ 724:138163. https://doi.org/10.1016/j.scitotenv.2020.138163.

Wang X, Hedberg YS, Odnevall I. 2022a. Presence of impurities of nickel and cobalt in facial cosmetic pigments and their dissolution into artificial sweat. Contact Dermatitis 87(6):550-553. https://doi.org/10.1111/cod.14212.

Wang N, Li X, Hu M, et al. 2022b. Ordered macroporous superstructure of bifunctional cobalt phosphide with heteroatomic modification for paired hydrogen production and polyethylene terephthalate plastic recycling. Appl Catal B Environ 316 https://doi.org/10.1016/j.apcatb.2022.121667.

Washburn TC, Kaplan E. 1964. Cobalt therapy and goiter. Clin Pediatr (Phila) 3:89-92. https://doi.org/10.1177/000992286400300207.

Watanabe T, Kataoka Y, Hayashi K, et al. 2022. Dietary exposure of the Japanese general population to elements: Total diet study 2013-2018. Food Saf (Tokyo) 10(3):83-101. https://doi.org/10.14252/foodsafetyfscj.D-22-00003.

Watanabe CH, Gontijo ESJ, Domingues MT, et al. 2023. Impact of aquatic humic substances on speciation and toxicity of arsenic and cobalt to Ceriodaphnia dubia. Environ Sci Pollut Res Int 30(31):77238-77245. https://doi.org/10.1007/s11356-023-27994-z.

Weakly JN. 1973. The action of cobalt ions on neuromuscular transmission in the frog. J Physiol 234(3):597-612. https://doi.org/10.1113/jphysiol.1973.sp010363.

Weber K, Bruer G, Krueger N, et al. 2023. Regenerative and progressing lesions in lungs and lung-associated lymph nodes from fourteen 90-day inhalation studies with chemically different particulate materials. Toxicol Lett (online ahead of print) https://doi.org/10.1016/j.toxlet.2023.12.011.

Wehner AP, Craig DK. 1972. Toxicology of inhaled NiO and CoO in Syrian golden hamsters. Am Ind Hyg Assoc J 33(3):146-155. https://doi.org/10.1080/0002889728506624.

Wehner AP, Busch RH, Olson RJ, et al. 1977. Chronic inhalation of cobalt oxide and cigarette smoke by hamsters. Am Ind Hyg Assoc J 38(7):338-346. https://doi.org/10.1080/0002889778507627.

Wellman PJ, Watkins PA, Nation JR, et al. 1984. Conditioned taste aversion in the adult rat induced by dietary ingestion of cadmium or cobalt. Neurotoxicology 5(2):81-90.

Westberg H, Bryngelsson IL, Marsh G, et al. 2017a. Mortality among hardmetal production workers: The Swedish cohort. J Occup Environ Med 59(12):e263-e274. https://doi.org/10.1097/JOM.0000000000001054.

Westberg H, Bryngelsson IL, Marsh G, et al. 2017b. Mortality among hardmetal production workers: Swedish measurement data and exposure assessment. J Occup Environ Med 59(12):e327-e341. https://doi.org/10.1097/JOM.0000000000001147.

WH. 2021a. Fact sheet: President Biden signs executive order catalyzing America's clean energy economy through federal sustainability. Washington, DC: The White House. https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/. February 12, 2024.

WH. 2021b. Executive Order 14057-Catalyzing clean energy industries and jobs through federal sustainability. The White House. Fed Regist 86(236):70935-70943. https://www.govinfo.gov/content/pkg/FR-2021-12-13/html/2021-27114.htm. February 12, 2024.

WHO. 2010. WHO guidelines for indoor air quality: Selected pollutants. World Health Organization. https://www.who.int/publications/i/item/9789289002134. April 25, 2012.

WHO. 2022. Guidelines for drinking-water quality. Fourth edition incorporating the first and second addenda. Geneva: World Health Organization. https://www.who.int/publications/i/item/9789240045064. September 18, 2023.

Wild P, Perdrix A, Romazini S, et al. 2000. Lung cancer mortality in a site producing hard metals. Occup Environ Med 57(8):568-573. https://doi.org/10.1136/oem.57.8.568.

Williams DE, Vlamis J, Pukite AH, et al. 1985. Metal movement in sludge-treated soils after six years of sludge addition: 2. Nickel, cobalt, iron, manganese, chromium, and mercury. Soil Science 140(2):120-125.

Windom HL, Schropp SJ, Calder FD, et al. 1989. Natural trace metal concentrations in estuarine and coastal marine sediments of the southeastern United States. Environ Sci Technol 23(3):314-320. https://doi.org/10.1021/es00180a008.

Winger PV, Schultz DP, Johnson WW. 1990. Environmental contaminant concentrations in biota from the lower Savannah River, Georgia and South Carolina. Arch Environ Contam Toxicol 19(1):101-117. https://doi.org/10.1007/BF01059818.

Wojcik KM, Holle AV, O'Brien KM, et al. 2024. Seasonal patterns in trace elements assessed in toenails. Environ Adv 15:100496. https://doi.org/10.1016/j.envadv.2024.100496.

Wong PK. 1988. Mutagenicity of heavy metals. Bull Environ Contam Toxicol 40(4):597-603. https://doi.org/10.1007/BF01688386.

WQP. 2023. Water quality portal data: Cobalt. National Water Quality Monitoring Council. https://www.waterqualitydata.us/portal/. August 30, 2023.

Wu P, Lu G, Cai C. 2021. Cobalt–molybdenum synergistic catalysis for the hydrogenolysis of terephthalate-based polyesters. Green Chem 23(21):8666-8672. https://doi.org/10.1039/d1gc02929k.

Wu CJ, Ho AC, Chen SY, et al. 2023a. Exposure to heavy metals and serum adiponectin levels among workers: A 2-year follow-up study. Metabolites 13(2):158. https://doi.org/10.3390/metabo13020158.

Wu L, Cui F, Zhang S, et al. 2023b. Associations between multiple heavy metals exposure and neural damage biomarkers in welders: A cross-sectional study. Sci Total Environ 869:161812. https://doi.org/10.1016/j.scitotenv.2023.161812.

Xie H, Smith LJ, Holmes AL, et al. 2016. The cytotoxicity and genotoxicity of soluble and particulate cobalt in human lung epithelial cells. Environ Mol Mutagen 57(4):282-287. https://doi.org/10.1002/em.22009.

Yamagata N, Murata S, Torii T. 1962. The cobalt content of human body. J Radiat Res 3(1):4-8. https://doi.org/10.1269/jrr.3.4. 2/3/2021.

Yamatani K, Saito K, Ikezawa Y, et al. 1998. Relative contribution of Ca2+-dependent mechanism in glucagon-induced glucose output from the liver. Arch Biochem Biophys 355(2):175-180. https://doi.org/10.1006/abbi.1998.0710.

Yokota K, Johyama Y, Kunitani Y, et al. 2007. Urinary elimination of nickel and cobalt in relation to airborne nickel and cobalt exposures in a battery plant. Int Arch Occup Environ Health 80(6):527-531. https://doi.org/10.1007/s00420-006-0159-7.

Yuan Y, Hilliard G, Ferguson T, et al. 2003. Cobalt inhibits the interaction between hypoxia-inducible factor-alpha and von Hippel-Lindau protein by direct binding to hypoxia-inducible factor-alpha. J Biol Chem 278(18):15911-15916. https://doi.org/10.1074/jbc.M300463200.

Yukawa M, Amano K, Suzuki-Yasumoto M, et al. 1980. Distribution of trace elements in the human body determined by neutron activation analysis. Arch Environ Health 35(1):36-44. https://doi.org/10.1080/00039896.1980.10667459.

Zaksas N, Gluhcheva Y, Sedykh S, et al. 2013. Effect of $CoCl_2$ treatment on major and trace elements metabolism and protein concentration in mice. J Trace Elem Med Biol 27(1):27-30. https://doi.org/10.1016/j.jtemb.2012.07.005.

Zeiger E, Anderson B, Haworth S, et al. 1992. Salmonella mutagenicity tests: V. Results from the testing of 311 chemicals. Environ Mol Mutagen 19(Suppl 21):2-141. https://doi.org/10.1002/em.2850190603.

Zeng X, Liu D, Wu Y, et al. 2023. Heavy metal risk of disposable food containers on human health. Ecotoxicol Environ Saf 255:114797. https://doi.org/10.1016/j.ecoenv.2023.114797.

Zhang H, van den Berg CMG, Wollast R. 1990. The determination of interactions of cobalt (II) with organic compounds in seawater using cathodic stripping voltammetry. Mar Chem 28:285-300. https://doi.org/10.1016/0304-4203(90)90049-I.

Zhang S, Holy CE, Eichenbaum G, et al. 2021. Carcinogenic assessment of cobalt-containing alloys in medical devices or cobalt in occupational settings: A systematic review and meta-analysis of overall cancer risk from published epidemiologic studies. Regul Toxicol Pharmacol 125:104987. https://doi.org/10.1016/j.yrtph.2021.104987.

Zhang J, Wen Y, Wu X, et al. 2022. Contamination and health risk assessment of heavy metals in toys. Asian J Ecotoxicol 17(4):345-353.

Zheng F, Luo Z, Zheng C, et al. 2019. Comparison of the neurotoxicity associated with cobalt nanoparticles and cobalt chloride in Wistar rats. Toxicol Appl Pharmacol 369:90-99. https://doi.org/10.1016/j.taap.2019.03.003.

Zylicz E, Zabloina R. 1976. Placental transfer of ^{60}Co as a function of gestation age. Nukleonika 12:1204-1210.

Zylicz E, Zablotna R, Geisler J, et al. 1975. Effects of DTPA on the deposition of 65Zn, 60Co and 144Ce in pregnant rat and in foetoplacental unit. Int J Radiat Biol Relat Stud Phys Chem Med 28(2):125-136. https://doi.org/10.1080/09553007514550861.

Zywiel MG, Brandt JM, Overgaard CB, et al. 2013. Fatal cardiomyopathy after revision total hip replacement for fracture of a ceramic liner. Bone Joint J 95-B(1):31-37. https://doi.org/10.1302/0301-620X.95B1.30060.