

CAS 7440-43-9

Substance name Cadmium

Toxicity

Cadmium and cadmium compounds are classified as carcinogens by authoritative sources.¹⁻⁴ Cadmium produces lung and other cancers in laboratory animals by multiple routes of exposures.¹ Studies of people exposed to cadmium have reported excess lung and prostate cancers although co-exposures to other carcinogens often limit the human evidence.¹ It appears that ionic cadmium is genotoxic.¹ Cadmium accumulates in liver and kidney and can cause kidney damage if the levels in the kidney are high enough.^{3,5} Cadmium damages male and female reproductive organs and tissues in rats and mice and is classified as a reproductive hazard by the European Union and the state of California.^{4,7} Young animals exposed to cadmium before birth have shown impaired growth and neurobehavioral effects.^{4,5,7}

Exposure

Cadmium is used primarily in the manufacture of nickel-cadmium batteries. It is also used as pigments for plastics, ceramic, and glass; as a stabilizer for polyvinyl chloride (PVC); and in alloys and coatings on steel and other non-ferrous metals.^{4,5} The Danish EPA detected cadmium in children's school supplies, such as pencil cases and school bags.⁶ A Danish investigation of jewelry from south Asia detected significant amount of cadmium in some "silver" items and demonstrated that cadmium could migrate out of these items in artificial sweat.⁴

References

1. U.S. DHHS, PHS, National Toxicology Program. Report on Carcinogens, Eleventh Edition. 2005. <http://ntp.niehs.nih.gov/ntp/roc/eleventh/profiles/s028cadm.pdf>.
2. WHO, International Agency for Research on Cancer (IARC) Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume No 58, Beryllium, Cadmium, Mercury, and Exposures in the Glass Manufacturing Industry, 1993.
3. U.S.EPA, Integrated Risk Information System (IRIS). Cadmium (last revised 1994).
4. European Commission, Joint Research Centre. European Union, Risk Assessment Report for Cadmium Metal, Part II Human Health. 2007 http://ecb.jrc.ec.europa.eu/DOCUMENTS/Existing-Chemicals/RISK_ASSESSMENT/REPORT/cdmetalreport303.pdf
5. ATSDR 2008 Toxicological Profile for Cadmium, Draft for Public Comment, September 2008. <http://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=48&tid=15>
6. Danish Ministry of the Environment, Environmental Protection Agency. Surveys on Chemicals in Consumer Products. Report 84, Survey as well as health assessment of chemical substances in school bags, toy bags, pencil cases and erasers, 2007.
7. California EPA, Office of Environmental Health Hazard Assessment (OEHHA), Reproductive and Cancer Hazard Assessment Section. Proposition 65 Maximum Allowable Daily Level (MADL) for Reproductive Toxicity for Cadmium (Oral Route), May 2001. http://www.oehha.org/prop65/law/pdf_zip/cadmium%20MADL.pdf.