

Birth Defect Research for Children, inc.

Fact Sheets

Formaldehyde and Birth Defects

What is formaldehyde? Formaldehyde is a colorless, unstable gas with a suffocating odor. Formaldehyde is a breakdown product of methanol that further breaks down into formic acid. Its commercial use is usually as formalin, a 37 to 50 percent mixture with water, plus 10 to 15 percent methanol added for stability.

What is it used for? Formaldehyde is used as a fumigant, disinfectant, herbicide, germicide, fungicide, and insecticide; in polyacetal, melamine, phenolic and urea resins; synthetic fabrics, dyes, and explosives; rubber preservatives and coatings; in chemical analysis and synthesis; preservation of biological specimens and embalming; in drilling mud, photographic developers, and fertilizers. Formaldehyde can be an ingredient in many household products, including shampoo, hair creams and lotions, skin cleansers, nail polish and hardeners, dishwashing liquids, make-up, and as an additive for wrinkle-free fabrics. Exposure to formaldehyde occurs by vapors released by commonly used pressed woods and urea-formaldehyde insulation, polluted urban air, petroleum combustion, wood burning stoves, and smoking. Mobile homes are major sources of formaldehyde exposure because of extensive use of manufactured wood products. The vapors of these manufactured products in combination with well-insulated, tight construction result in poor ventilation.

Acute Effects: The major routes of exposure of formaldehyde are by inhalation and through the skin. Low level exposure results in eye, skin, and respiratory tract irritation.

At high levels, chest tightness, headache, palpitations, eye burns, and occasionally death may occur. Formaldehyde is in Class 3 for general toxicity: may cause irreversible effects that can be life threatening.

Chronic Effects: The major concerns with repeated formaldehyde exposure are sensitization and cancer. It is considered a potent sensitizer. It has been associated with cases of asthma. Formaldehyde can cause contact dermatitis and is a common cause of occupational skin disease.

Reproductive effects: Reproductive data are limited. One study of occupational in women is reported menstrual irregularities. Other studies have found an increased risk of spontaneous abortion. Major and minor birth defects were significantly increased in a cohort study of 271 infants of operating room nurses who reported exposure to formalin during the first trimester of pregnancy. However, the nurses were also exposed to other agents including volatile anesthetics and ionizing radiation during the same period. Formaldehyde is listed as a Class A- for reproductive hazard: unconfirmed human reproductive hazard. The actual human reproductive hazard is not known.

Genetic Effects: Increased frequencies of chromosome aberrations have been found in formaldehyde exposed morticians, fertilizer manufacturer workers, and anatomy laboratory workers.

Carcinogenic Effects: There is considerable evidence that formaldehyde can cause cancer in both experimental animals and humans. Several large epidemiological studies concluded that exposure to formaldehyde is associated with increased risk of nasal, mouth, or throat cancer in humans. At a 1984 consensus workshop on formaldehyde, there was agreement that anatomists, embalmers, and pathologists are at increased risk for leukemia, brain, lung, mouth, and pharyngeal cancers. An EPA risk assessment published in 1987 concluded that formaldehyde is a probable human carcinogen.

Resources

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