TerranearPMC Safety Share

Week of June 27, 2011 – Recent Inclusions to the Report on Carcinogens

On June 10, the U.S. Department of Health and Human Services added eight substances to its *Report on Carcinogens* (RoC). This is a science-based document, mandated by Congress that classifies agents, substances, mixtures and exposures that have been identified as a human carcinogen, or is reasonably anticipated to be a human carcinogen. The National Toxicology Program (NTP) prepares the RoC on behalf of the Secretary, Health and Human Services.

The eight substances are:

- Formaldehyde and Botanical Aristolochic acids - as known human carcinogens and;
- Captafol, Cobalt-tungsten carbide, Glass wool fibers (inhalable), O-nitrotoluene, Riddelline and Styrene – as substances reasonably anticipated to be human carcinogens

While some of the above-listed substances may have a ring of familiarity, others may not even register the slightest indication of recollection. Below is a brief description of these substances, their uses and the greatest likelihood of an exposure scenario.

Aristolochic acids are a family of acids found naturally in the plants Aristolochia and Asarum, which grow throughout the US and world and have been used as herbal medicines used to treat a wide variety of symptoms and diseases, such as arthritis, gout, and inflammation. Consumption of products containing aristolochic acid has been associated with permanent kidney damage, sometimes resulting in kidney failure that has required kidney dialysis or kidney transplantation. In addition, some patients have developed certain types of cancers, most often occurring in the urinary tract. However, there are a number of professionals within the holistic community that defend the use of these plants.

Captafol is a fungicide that is used to control almost all fungal diseases of plants except powdery mildews. While its harmful effects have been known since the 1980's, in 1999, the EPA banned its use on all crops except onions, potatoes, and tomatoes. By 2006, the ban on captafol was even applied to these crops.

***O*-Nitrotoluene** is used primarily in the production of numerous chemicals (such as *o*-toluidine). It is also used in the manufacture of dyes, such as magenta and various sulfur dyes for cotton, wool, silk, leather, and paper. In addition, it is used as an intermediate in the synthesis of explosives and a variety of organic chemicals, including compounds used in the agricultural, petrochemical, pharmaceutical, and rubber industries. O-nitrotoluene has been found in groundwater, private well water, surface water, and soil at or near munitions production facilities and military training grounds

About 70% of **cobalt–tungsten carbide** hard-metal production is used for cutting tools and 30% for wear-resistant materials, primarily for tools for mining and grinding operations. Epidemiological studies provide evidence for the carcinogenicity of cobalt–tungsten carbide powders and hard metals based on consistent findings of excess lung-cancer mortality among cobalt–tungsten carbide hard-metal manufacturing workers.

Riddelliine (not to be confused with riddlin - the drug for treatment of attention-deficit hyperactivity disorder) belongs to a class of toxic pyrrolizidine alkaloids and is isolated from plants of the genera Crotalaria,

Amsinckia, and Senecio that grow in the western United States. Cattle, horses, and sheep that ingest these plants succumb to their toxic effects. Riddelliine residues have been found in meat, milk, and honey, while the plants may contaminate human food source. At least 13 *Senecio* species worldwide have been identified that are used in herbal medicines or possibly as food.

Glass wools fibers are manufactured inorganic fibrous materials that contain aluminum or calcium silicates and are made from a variety of materials, including rock, clay, slag, or glass. The chemical composition of glass wool products varies depending on the manufacturing requirement and end use, but almost all contain silicon dioxide as the single largest oxide ingredient for the production of glass. The primary exposure concern is through inhalation where studies have indicated a strong correlation between inhalation of glass wool fibers to various forms of lung cancer, including mesothelioma. The primary use of glass wool is for thermal and sound insulation. The largest use of glass wool is for home and building insulation in the form of loose wool, batts (insulation in the form of a blanket, rather than a loose filling), blankets or rolls, or rigid boards for acoustic insulation. Occupational exposure to glass fibers by inhalation is the major issue of concern. However, homeowners engaged in home remodeling projects potentially are exposed to insulation materials through the removal and replacement of existing products.

Styrene is an aromatic hydrocarbon that occurs as a colorless or yellowish viscous liquid with a sweet, floral odor. It is used in the synthesis and manufacture of polystyrene and hundreds of different copolymers, as well as numerous other industrial resins. Current studies indicate an evidence for the carcinogenicity due to an increased mortality from or incidence of cancer of the lymphohematopoietic system (lymphocyte and blood cell production). Exposure to styrene can occur in both occupational and non-occupational settings. However, workers in certain occupations do have a greater risk than the general population. The greatest source of exposure for the general population is cigarette smoking, The highest levels of occupational exposure to styrene occur in the fabrication of products such as boats, car and truck parts, tanks, bathtubs, and shower stalls from glass-fiber-reinforced polyester composite plastics.

Probably, the most notable substance listed is **formaldehyde**. This material has been the known as an occupational health hazard for years. As far back as 1987 many health agencies, national and international, have recognized formaldehyde's harmful effects. Formaldehyde main route of exposure is inhalation, although ingestion is just as lethal (one ounce of a 37% solution is considered a fatal dose). From an occupational standpoint, workers are exposed to formaldehyde through the use of such building materials as press-board, glues, and laminates. Complaints of eye irritation, headaches and difficulty breathing and aggravating asthma symptoms are common concerns among construction workers. Formaldehyde off-gassing (the vaporization from the fabricated material) is a process that continues well after the installing of construction materials. Epidemiological studies have demonstrated a relationship between exposure to formaldehyde and cancer in humans. Nasopharyngeal, sinonasal and lymphohematopoietic cancers have all been linked to formaldehyde exposures. Embalmers are known to have the greatest exposure risk. Formaldehyde is ubiquitous in the environment and has been detected in indoor and outdoor air, soil, food, treated and bottled drinking water, surface water, and groundwater. In addition, the general population can be exposed to formaldehyde from the use of cosmetic products that contain formaldehyde.

Do not spoil what you have by desiring what you have not; remember that what you now have was once among the things you only hoped for. – Epicurus (Greek Philosopher)