HESIS

Chemical Watch List (April 2012)

The Hazard Evaluation System and Information Service (HESIS) is responsible for monitoring emerging chemical hazards in the California workplace. The following are chemicals for which HESIS personnel are currently tracking new developments:

- **Methylene Chloride (MeCl)**
  - ✓ *Background:* MeCl is a well-known hazard and was the topic of a 2006 HESIS Fact Sheet (http://www.cdph.ca.gov/programs/hesis/Documents/methylenechloride.pdf).
  - ✓ *New developments:* The Occupational Health Branch recently learned of two MeCl-related fatalities (occurring over the last two years) in California workers.
  - ✓ *Current activities:* HESIS is assisting in the investigation of recent MeCl-related fatalities and drafted a MeCl Hazard Alert, distributing it to furniture and bathtub refinishers: (http://www.cdph.ca.gov/programs/hesis/Documents/MethyleneChlorideAlert.pdf).

- **Tertiary-Butyl Acetate (TBAc)**
  - ✓ *Background:* TBAc is an organic solvent used in industry for architectural coatings, as a degreaser, and for some surface treatment applications. It is metabolized to tert-butyl alcohol (TBA), a reported animal carcinogen (NTP 1995). However, effective December 2004, TBAc was exempted as a volatile organic compound (VOC) by US EPA primarily based on its low photo-reactivity (*Federal Register* 2004; 69:69298).
  - ✓ *New developments:* TBAc is also under consideration for VOC exemption by the California Air Resources Board and local air districts. It is anticipated that VOC exemption to TBAc will expand its use at workplaces in California resulting in increased health risk to workers.
  - ✓ *Current activities:* HESIS staff is reviewing the published literature on TBAc toxicity to identify the critical data gaps to critically examine potential VOC exemption. HESIS is interested in promoting safer alternatives to TBAc such as water-based products. HESIS closely follows the development in the VOC exemption process at state and district levels.

- **Glymes**
  - ✓ *Background:* Glymes are di-alkyl ethers of ethylene glycol. As inert polar compounds they are used as solvents in industries and in many consumer products (*Federal Register* 2011; 76:40850). Glymes have been shown to cause reproductive and developmental effects as well as genotoxicity in experimental animals, presumably due to their metabolic conversion to corresponding toxic alkoxyacetic acids (*Toxicol* 1987; 43:17; *Teratol* 1987; 35:321; *Toxicol Applied Pharmacol* 1988; 94:150).
  - ✓ *New developments:* In July 2011, US EPA proposed a 'Significant New Use Rule' for the 14 glymes that are in commerce because of its concern about the potential human adverse health effects. This action requires the advance notification of the significant new use of these glymes by manufacturers and/or users.
  - ✓ *Current activities:* HESIS continues to review the published literature on glymes and their potential human exposure both in workplaces and through consumer products in California. HESIS may propose to include these chemicals in the Biomonitoring California program in order to assess human exposure. HESIS will follow the outcome of EPA's proposal.

- **Bisphenol-A (BPA)**
  - ✓ *Background:* BPA is widely used in both epoxies and other plastic resins. Animal studies suggest that BPA may be a human endocrine disruptor (*Toxicol Sci* 2009; 108:427).
  - ✓ *New developments:* There have been a number of studies published in 2010-2011 further suggesting BPA's adverse effects on test animals and potentially humans. Cabaton et al. found a dose response relationship between perinatal BPA exposure in female mice and decreased reproductive capacity (*Environ Health Perspect.* 2011; 119(4):547). Melzer et al. reported associations between BPA exposure and estrogenic gene expression in a cross-sectional study of a sample of European adult males (*Environ Health Perspect.* 2011; 119(12):1788-1793).
  - ✓ *Current activities:* HESIS will work with Cal/OSHA and with OHSEP to identify segments of the California workforce with potentially significant BPA exposures, and to monitor the reproductive sciences literature relevant to potential BPA toxicity.

- **Nanoparticles**
  - ✓ *Background:* Nanoparticles (particles measuring less than 100 nanometers in diameter) are contained in a wide range of consumer products from sunscreens and personal care products to sporting goods. While many studies are being performed to describe the toxicological properties of nanomaterials, little is known about how workers are exposed to nanoparticles during the life cycle of products containing them. Evidence from experiments in animals and *in vitro* continues to suggest that some nanoparticles may cause adverse health effects. Carbon nanotubes have been shown to cause effects similar to asbestos *in vitro* and in animal models. Nanoparticulate zinc and titanium oxides, which are widely used in personal care products, have been shown to cause toxicity in a variety of cells, including human.
  - ✓ *New developments:* The National Institute for Occupational Safety and Health (NIOSH) published "Current Intelligence Bulletin 63: Occupational Exposure to Titanium Dioxide" in April, 2011. This document includes guidance for workplace handling of fine and ultrafine (including engineered nanoparticulate) titanium dioxide (TiO_2). Based on available evidence, NIOSH classified ultrafine TiO_2 as a potential occupational carcinogen and recommended an exposure limit of 0.3 mg/m^3 as a time-weighted average for occupational exposures to ultrafine TiO_2 for up to 10 hour days and up to 40 hours per week. The California Department of Toxic Substances Control (DTSC) is currently performing a data call-in (ending December 21, 2011) on various nanomaterials including TiO_2 in order to understand how these materials are used in California.
  - ✓ *Current HESIS activities:* HESIS has convened a Nanotoxicology Working Group consisting of interested staff from the Occupational Health Branch, Environmental Health Laboratory Branch, and Food and Drug Branch of CDPH. The working group has invited academic experts to speak on specific topics within nanotoxicology. In addition, member(s) of the working group authored an article on surveillance for health hazards among workers exposed to engineered nanoparticles (Roisman et al., *J Occup Environ Med* 2011; 53(6 Suppl), S38-41). HESIS staff continue to monitor the scientific literature – and to liaison with sister agencies – to keep up with developments in this field.