Health & Safety News

Some Chemical Things Considered: N-Methyl-2-pyrrolidone: Characteristics and Hazards

Characteristics

Chemical Formula: C_5H_9NO
CAS#: 872-50-4
Molecular wt.: 99.1322
Synonyms: N-Methyl-2-pyrrolidinone, 1-Methyl-2-pyrrolidone, 1-Methyl-2-pyrrolidinone, NMP
Selected Trade Names: Citristrip Paint & Varnish Remover, Parks Pro Stripper II Liquid Paint Stripper, Woodfinishers Pride Paint Remover, Aqua Mix Coating and Sealer Stripper

N-Methyl-2-pyrrolidone (NMP) is a water-miscible organic solvent. It is a basic and polar compound. It is a hygroscopic colorless liquid with a mild amine odor. It is highly soluble in lower alcohols, lower ketones, ether, ethyl acetate, chloroform, and benzene and moderately soluble in aliphatic hydrocarbons. NMP is used industrially as a solvent for the extraction of petrochemicals, in the microelectronics fabrication industry, and in the manufacture of various compounds, including pigments, cosmetics, drugs, and pesticides. Increasingly NMP is used as a solvent substitute for chlorinated hydrocarbons. NMP is commercially available as a graffiti remover and as a paint and varnish stripper. (1) NMP has been suggested for use as a solvent in art conservation as an alternative to more hazardous chemicals present in commercial paint strippers such as methylene chloride. (2) NMP has also been used as an alternative to dimethylformamide (DMF).

Hazards

The National Fire Protection Association classifies NMP as a class 2 health hazard. NMP is combustible when exposed to heat, open flame or powerful oxidizers. The acute toxicity of NMP is considered to be low. However, NMP is considered to be a recognized developmental toxicant. It is also suspected to be a cardiovascular or blood toxicant, kidney toxicant, neurotoxicant and a reproductive toxicant. (3) NMP is not considered to be a carcinogen. NMP is easily and quickly absorbed into the skin and can also enhance the skin's permeability for other substances. (4) Therefore, it is necessary to prevent exposure to the skin and eyes.

Exposure routes: Inhalation, dermal absorption
Target organs and systems: Skin, eyes
Symptoms: Coughing, headaches, dermatitis with edema and erythema with prolonged and repeated contact, chronic to severe eye irritation (5)
Exposure Limits: The TLV has not been established for this compound. (6)AIHA (WEEL): 10 ppm, 8-hr TWAOral LD_{50}(rat): 3914 mg/kgSkin LD_{50}(rabbit): 8 gm/kg
Personal Protection: protective chemical safety goggles, or full face shield if splashing is possible; protective clothing, butyl-rubber gloves; fume hood

Sources

1. World Health Organization. 2001. *Concise International Chemical Assessment Document 35: N-METHYL-2-PYRROLIDONE.* The International Programme on Chemical Safety (IPCS).
2. Wollbrinck, Thomas. 1993. The composition of proprietary paint strippers. *Journal of the American Institute for Conservation*. 32(1): 43–57.
3. Scorecard Chemical Profile for N-Methyl-2-Pyrrolidone, www.scorecard.org/chemical-profiles/summary.tcl?edf_substance_id=+872-50-4#ranking
4. World Health Organization. 2001. *Concise International Chemical Assessment Document 35: N-METHYL-2-PYRROLIDONE.* The International Programme on Chemical Safety (IPCS).
5. International Occupational Safety and Health Information Center(CIS). 1997. N-Methyl-2-Pyrrolidone. ICSC:0513. www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/_icsc05
6. Mallinckrodt Chemicals. 2002. MSDS: 1-Methyl-2-Pyrrolidone. www.jtbaker.com/msds AIC

—Marilen Pool, Objects Conservator, AIC Health & Safety Committee

People

Victoria Book has joined the Sam Noble Oklahoma Museum of Natural History, (405) 325-0598.

After more than 30 years in the Conservation Center at the Los Angeles County Museum of Art, Victoria Blyth Hill has announced her retirement in June 2005. She will continue her involvement with the conservation field through ongoing research, grants and publications, and will be appointed conservator emeritus at LACMA. She will also expand her private practice with a focus on South and Southeast Asian (SSEA), Asian, and contemporary art. AIC

Worth Noting

GCI–ICCROM Collaboration on AATA Online

The Getty Conservation Institute and ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) announce the commencement of a two-year collaboration that will considerably strengthen AATA Online, the major bibliographic reference tool produced by the GCI in association with the IIC (The International Institute for Conservation of Historic and Artistic Works).

Through this initiative, launched in October 2004, a significant selection of the holdings of the ICCROM's Library will be abstracted for inclusion in AATA Online. The project will focus on conservation literature in language and subject areas that are not yet comprehensively covered in AATA Online.

The ICCROM Library contains the world's most extensive collection of resources on every aspect of heritage conservation in a wide variety of languages. There are currently more than 86,000 references registered in the collection. Literature in non-Western languages and publications from Eastern European, African, and Middle Eastern