

***n*-Butyl 2,3-epoxypropyl ether**  
**C<sub>7</sub>H<sub>14</sub>O<sub>2</sub>**  
**[CAS No.2426-08-6]**  
**OEL-M: 0.25 ppm (1.33 mg/m<sup>3</sup>)**  
**Occupational carcinogen: Group 2B**  
**Occupational sensitizer: Skin Group 2**  
**Reproductive toxicant: Group 3**

Summary of OEL-C documentation

*n*-Butyl 2,3-epoxypropyl ether [BGE, CAS No.2426-08-6] is an odiferous, colorless liquid at room temperature (boiling temperature 164°C; saturated vapor pressure 0.43 kPa [25°C]) and is used as a major reactive diluent for industrial epoxy or alkyd resin, stabilizer for chlorinated solvent, disperse dye, cotton or wool surface modifier, and dye improvement agent. It is inflammable and may form explosive peroxide if exposed to air.

The No-observed-adverse-effect-level (NOAEL) in mice was considered 5 ppm based on the observed pathological changes such as necrosis or metaplasia of respiratory epithelial cell and atrophy of olfactory epithelium at or above 25 ppm in a 13-week inhalation study (12.5~200 ppm)<sup>1)</sup>, and increased incidence of angioma in the nasal cavity at or above 15 ppm in a 2-year inhalation study (5, 15, and 45 ppm)<sup>2)</sup>. Uncertainty factors of 2 for interspecies differences and 5 for severity of observed carcinogenic effect in animal were applied. The JSOH proposed 0.25 ppm as OEL-M for BGE based on those toxicity testing results.

BGE is a mutagen both *in vitro* and *in vivo*, and there are animal data indicating carcinogenicity<sup>2,3)</sup>. There is evidence that BGE is a male reproductive toxicant in rodents<sup>4,5)</sup>. Skin irritation and sensitization have been reported in humans<sup>6,7)</sup>. Therefore, carcinogenicity classification is proposed as group 2B, reproductive toxicant as

group 3, and skin occupational sensitizer as group 2.

Year of Proposal: 2016

**References**

- 1) Japan Bioassay Research Center: 13-week testing report 0416: inhalation study of butyl-2,3-epoxypropyl ether in mice. [Online] Available from: URL: [http://anzeninfo.mhlw.go.jp/user/anzen/kag/pdf/gan/0416\\_MAIN.pdf](http://anzeninfo.mhlw.go.jp/user/anzen/kag/pdf/gan/0416_MAIN.pdf) (in Japanese)
- 2) Japan Bioassay Research Center: Carcinogenicity testing report 0438: inhalation study of butyl-2,3-epoxypropyl ether in mice. [Online] Available from: URL: [http://anzeninfo.mhlw.go.jp/user/anzen/kag/pdf/gan/0438\\_MAIN.pdf](http://anzeninfo.mhlw.go.jp/user/anzen/kag/pdf/gan/0438_MAIN.pdf) (in Japanese)
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- 4) Hine H, Rowe VK, White ER, Darmer K, Youngblood GT. Epoxy compounds. In: Clayton GD, Clayton FE eds. Patty's Industrial Hygiene and Toxicology, 3ed rev. ed., vol.2A, John Wiley and Sons, New York, Brisbane, Toronto; 1981: 2201.
- 5) Whorton EB Jr, Pullin TG, Frost AF, Onofre A, Legator MS, Folse DS. Dominant lethal effects of *n*-butyl glycidyl ether in mice. *Mutat Res* 1983; 124: 225-233.
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- 7) Kanerva L, Jolanki R, Alanko K, Estlander T. Patch-test reactions to plastic and glue allergens. *Acta Derm Venereol* 1999; 79: 296-300.