

Trichloroethylene
Cl₂C=CHCl
[CAS No. 79-01-6]
Occupational carcinogen: Group 1

Summary of classification

The IARC raised the classification of trichloroethylene (TCE) from Group 2A, “probable human carcinogen” (monograph Vol. 63 (1995)), to Group 1, “human carcinogen” (monograph Vol. 106 (2014)), based on the judgement that there is sufficient evidence for carcinogenicity. The Japan Society for Occupational Health (JSOH) recommended an occupational exposure limit for TCE in 1997 and classified it as Group 2B with respect to classification of carcinogenicity. Since a sufficient number of cohort studies and case-control studies has accumulated and a significant increase in risk of kidney cancer^{1,2)} has been observed, we have now judged that there is sufficient evidence in the accumulated epidemiological data for the carcinogenicity of TCE. Also, there is sufficient evidence from experimental animals for the carcinogenicity of TCE in the lung, liver and kidney^{3,4)}. In a mechanistic aspect, it was observed that metabolites of

GSH conjugation have genotoxicity and that no genotoxicity was observed for people with genetically low GST activity. Based on these findings, it is proposed that the classification for the carcinogenicity of TCE be changed from Group 2B to Group 1 by the JSOH.

Year of Proposal (revision): 2015

Year of Proposal: 1997 (Group 2B)

References

- 1) Scott CS, Jinot J. Trichloroethylene and Cancer: Systematic and Quantitative Review of Epidemiologic Evidence for Identifying Hazards. *Int J Environ Res Public Health* 2011; 8: 4238–72.
- 2) Karami S, Lan Q, Rothman N, Stewart PA, Lee KM, Vermeulen R, Moore LE Occupational trichloroethylene exposure and kidney cancer risk: a meta-analysis. *Occup Environ Med* 2012; 69: 858–67.
- 3) Fukuda K, Takemoto K, Tsuruta H. Inhalation carcinogenicity of trichloroethylene in mice and rats. *Ind Health* 1983; 21: 243–54.
- 4) Maltoni C, Lefemine G, Cotti G, Perino G. Long-term carcinogenicity bioassays on trichloroethylene administered by inhalation to Sprague-Dawley rats and Swiss and B6C3F1 mice. *Ann N Y Acad Sci* 1988; 534: 316–42.