

## Methanol: exposure and hazard

### EPA IRIS review, 2013

“Taking into account the advantages and limitations of the studies available for quantification purposes and the relative sensitivities for the effects observed, two developmental effect endpoints were chosen as co-critical effects for the purposes of this dose-response assessment, cervical rib anomalies in fetal CD-1 mice (Rogers et al., 1993b) and decreased brain weight in male Sprague-Dawley rats exposed throughout gestation and lactation (NEDO, 1987). These endpoints can be reliably quantified and represent adverse effects in two separate sensitive organ systems at key periods of their development. The monkey studies of Burbacher et al. (2004a; 2004b; 1999a; 1999b) and NEDO (1987) are qualitatively supportive, but are inadequate or inferior to the candidate principal rodent studies for quantitative dose-response analysis.”

[https://cfpub.epa.gov/ncea/iris/iris\\_documents/documents/subst/0305\\_summary.pdf](https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0305_summary.pdf)

### I.B.1. Chronic Inhalation RfC Summary

Critical Effect	Point of Departure (POD)	UF	POD/UF	Chronic RfC <sup>a</sup>
Reduced brain weight in rat pups at 6 weeks of age	POD <sub>Internal</sub> = 858 mg-hr/L	100	8.58 mg-hr/L	2 × 10 <sup>1</sup> mg/m <sup>3</sup>

## **1- Bromopropane: new hazard – neurological effects**

- NIOSH, CDPH hazard alert on neurological effects of 1-BP:  
[https://www.osha.gov/dts/hazardalerts/1bromopropane\\_hazard\\_alert.html](https://www.osha.gov/dts/hazardalerts/1bromopropane_hazard_alert.html)
- CalOSHA PEL (5 ppm) based on developmental/reproductive effects

## Diethylene Glycol monobutyl Ether: Usage

- Approx 1400 California workplaces
- Provisional RfC available = 0.0001 mg/m<sup>3</sup> (USEPA , SuperFund Program)

[https://hhpprtv.ornl.gov/issue\\_papers/DiethyleneGlycolMonobutylEther.pdf](https://hhpprtv.ornl.gov/issue_papers/DiethyleneGlycolMonobutylEther.pdf)

SIC	Total # of Users	Average Daily Amount (gal)
11-19	66	618.3
20-29	226	857.6
30-39	284	344.1
40-49	160	640.0
50-59	389	243.1
60-69	22	5.0
70-79	104	83.8
80-89	81	33.5
90-99	44	407.1
Total	1376	

**Dicyclopentadiene - substantial change in the value of an OEL**

**ACGIH, 2019: 0.5/1 ppm TWA/STEL to minimize potential for upper respiratory tract and eye irritation and central nervous effects.**

**PEL: 5 ppm based**

## Monochloroacetic acid: Usage, No PEL

ACGIH (2005) = 0.5 ppm; OELs are available for comparison

Country	Long-term exposure limit 8-h TWA	Short-term exposure limit 15-min-STEL	Skin Notation	Reference
UK	1.2 mg/m <sup>3</sup> (0.3 ppm)		Yes	HSE, 1998
NL	4 mg/m <sup>3</sup> (1 ppm)			SZW, 1996
S	4 mg/m <sup>3</sup> (1 ppm)	8 mg/m <sup>3</sup> (2 ppm)	Yes	AFS, 1993
USA	1 mg/m <sup>3</sup> (0.3 ppm)	4 mg/m <sup>3</sup> (1 ppm)	Yes	AIHA, 1984
D	The MAK-committee has proposed classifying MCAA as IIB (insufficient data to establish a MAK value) (Deutsche Forschungsgemeinschaft, 1997).			

**DEHP: seriousness of the hazard – reproductive and developmental effects**

- listed on ACGIH 2019 Notice of Intended Changes; 0.03 mg/m<sup>3</sup> proposed
- PEL of 5 mg/m<sup>3</sup> based on irritation and possible neurotoxicity (ACGIH, 2001)

# PCBTF ( p-chloro-alpha,alpha,alpha-trifluorotoluene): Usage

Tumors in rats and mice (NTP, 2018)

IARC will review November 2019

- <https://monographs.iarc.fr/wp-content/uploads/2018/12/Vol-125-Preliminary-List-of-Agents.pdf>

## Top types of facilities storing chemical:

SIC Code Descriptor	Number of Facilities
Null	140
Top, Body, and Upholstery Repair Shops and Paint Shops	79
#N/A	57
Paint, Glass, and Wallpaper Stores (glass)	50
Commercial Printing, Lithographic (quick printing)	31
Paints, Varnishes, and Supplies	27
Paints, Varnishes, Lacquers, Enamels and Allied Products	24
Lumber and Other Building Materials Dealers (except home centers)	15
Roofing, Siding, and Insulation Materials	12
General Automotive Repair Shops	10
Chemicals and Chemical Preparations, NEC (except frit and table salt)	8
General Warehousing and Storage (miniwarehouses and self-storage units)	7
Aircraft Parts and Auxiliary Equipment, NEC (research and development)	7
Signs and Advertising Specialties (signs)	6
Schools and Educational Services NEC (except instruction)	6
Wood Office Furniture	6
Chemicals and Allied Products, NEC	6
Motor Vehicle Supplies and New Parts (Wholesale) (auto parts sold via retail method)	6
Industrial Machinery and Equipment	6

HEAC June 4, 2019

## CONCLUSIONS

Under the conditions of these 2-year inhalation studies, there was *some evidence of carcinogenic activity\** of *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene in male Hsd:Sprague Dawley SD rats based on increased incidences of C-cell adenoma in the thyroid gland. The combined occurrences of alveolar/bronchiolar adenoma or carcinoma in the lung of male rats may have been related to treatment. There was *some evidence of carcinogenic activity* of *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene in female Hsd:Sprague Dawley SD rats based on increased incidences of C-cell adenoma in the thyroid gland, increased incidences of benign pheochromocytoma in the adrenal medulla, increased incidences of adenocarcinoma in the uterus, and increased incidences of stromal polyp in the uterus. There was *clear evidence of carcinogenic activity* of *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene in male B6C3F1/N mice based on increased incidences of hepatocellular carcinoma and hepatoblastoma in the liver. There was *clear evidence of carcinogenic activity* of *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene in female B6C3F1/N mice based on increased incidences of hepatocellular adenoma, hepatocellular carcinoma, and hepatoblastoma in the liver. The combined incidences of adenoma or adenocarcinoma in the Harderian gland of female mice were also considered to be related to treatment.

Exposure to *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene caused increased incidences of nonneoplastic lesions in the lung and liver of male and female rats and mice, in the nose of male rats, in the adrenal medulla and uterus of female rats, in the forestomach of male and female mice, and in the larynx in male mice. Exposure to *p*-chloro- $\alpha,\alpha,\alpha$ -trifluorotoluene caused increased severity of nonneoplastic lesions in the kidney of male rats.

## Carbon tetrachloride: Seriousness of hazard

USEPA IRIS review 2010:

- new RfC
- new lower Inhalation Unit Risk

### I.B.1. CHRONIC INHALATION RfC SUMMARY

Critical Effect	Point of Departure*	UF	Chronic RfC
<b>Fatty changes in the liver</b>	BMCL <sub>10[HEC]</sub> : 14.3 mg/m <sup>3</sup>	100	0.1 mg/m <sup>3</sup>
<b>Chronic inhalation toxicity study in rats</b>			
Nagano et al., 2007b; JBRC, 1998			

Risk Level	Lower Bound on Concentration Estimate
<b>E-4 (1 in 10,000)</b>	17 µg/m <sup>3</sup>
<b>E-5 (1 in 100,000)</b>	1.7 µg/m <sup>3</sup>
<b>E-6 (1 in 1,000,000)</b>	0.17 µg/m <sup>3</sup>



## **Phthalic Anhydride – substantial change in OEL, seriousness of hazard**

ACGIH, 2014: 0.001/0.005 ppm; basis: respiratory sensitization, asthma

PEL: 1 ppm

## **Titanium Dioxide: substantial change in OEL, seriousness of hazard**

- Titanium Dioxide is on the ACGIH Under Study List
- NIOSH recommends 2.4 mg/m<sup>3</sup> for fine TiO<sub>2</sub> and 0.3 mg/m<sup>3</sup> for ultrafine TiO<sub>2</sub>
- PEL for TiO<sub>2</sub>: 10 total/5 respirable mg/m<sup>3</sup>

From NIOSH Current Intelligence Bulletin 63:

“NIOSH recommends .... using the international definitions of respirable dust [CEN 1993; ISO 1995] and the NIOSH Method 0600 for sampling airborne respirable particles [NIOSH 1998].”

<https://www.cdc.gov/niosh/docs/2011-160/pdfs/2011-160.pdf>