The BG RCI is the legal successor of BG Chemie since 2010

BG RCI
Berufsgenossenschaft
Rohstoffe und chemische Industrie

TOXICOLOGICAL EVALUATIONS

BG RCI

Kurfürsten-Anlage 62 · D-69115 Heidelberg, Germany
Telefon: +49 6221 5108-28451
E-Mail: toxikologischebewertungen@bgrci.de
Internet: www.bgrci.de/toxicologicalevaluations

TOXICOLOGICAL EVALUATION

last updated: 11/2000

Chloro-p-xylene

No. 150

CAS No. 95-72-7

BG Chemie
Berufsgenossenschaft der chemischen Industrie

BG Chemie
P.O.B. 10 14 80, 69004 Heidelberg, Germany
Telephone: +49 (0) 6221 523 400
E-Mail: praevention@bgchemie.de
Internet: www.bgchemie.de

Chloro-p-xylene

1 Summary and assessment

According to the studies available, chloro-p-xylene is of low toxicity upon single oral administration (LD_{50} rat oral 3310 mg/kg body weight).

Chloro-p-xylene is irritating to the rabbit skin, whereas it is found not to cause irritation to the rabbit eye.

2 Name of substance

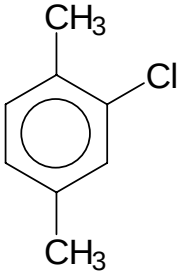
2.1	Usual name	Chloro-p-xylene
2.2	IUPAC name	2-Chloro-1,4-dimethylbenzene
2.3	CAS No.	95-72-7
2.4	EINECS No.	202-444-2

3 Synonyms, common and trade names

Benzene, 2-chloro-1,4-dimethyl-
2-Chlor-1,4-dimethylbenzol
2-Chloro-p-xylene
Chlor-p-xylol
1,4-Dimethyl-2-chlorbenzol
1,4-Dimethyl-2-chlorobenzene

4 Structural and molecular formulae

4.1 Structural formula



4.2 Molecular formula C_8H_9Cl

5 Physical and chemical properties

5.1	Molecular mass, g/mol	140.61	
5.2	Melting point, °C	1.6 1.3	(Lide and Frederikse, 1996) (Hoechst, 1986 a, b, c)
5.3	Boiling point, °C	187 184	(Lide and Frederikse, 1996) (Hoechst, 1986 a, b, c)
5.4	Vapour pressure, hPa	No information available	
5.5	Density, g/cm³	1.0589 (at 15 °C) 1.059 (at 20 °C)	(Lide and Frederikse, 1996) (Hoechst, 1986 a, b, c)
5.6	Solubility in water	Insoluble 28 mg/l (at 20 °C)	(Lide and Frederikse, 1996) (Hoechst, 1986 a, b, c)
5.7	Solubility in organic solvents	Soluble in acetone and tetrachloromethane, dissolves very well in benzene Soluble in anhydrous organic solvents	(Lide and Frederikse, 1996) (Hoechst, 1986 a, b, c)
5.8	Solubility in fat	No information available	
5.9	pH value	7	(Hoechst, 1986 a, b, c)
5.10	Conversion factor	1 ml/m³ (ppm) ≙ 5.77 mg/m³ 1 mg/m³ ≙ 0.173 ml/m³ (ppm) (at 1013 hPa and 25 °C)	

6 Uses

Solvent, starting product for dyestuffs (Hoechst, 1987).

7 Experimental results

7.1 Toxicokinetics and metabolism

No information available.

7.2 Acute and subacute toxicity

Acute oral toxicity was determined in accordance with OECD guideline No. 401. Groups of 5 male and 5 female Wistar rats (weighing 176 to 192 and 171 to 193 g, respectively) were given single doses of chloro-p-xylene (> 99% pure) in sesame oil by oral gavage at levels ranging from 2000 to 5000 mg/kg body weight. The observation period was 14 days. For males, an LD_{50} value of 2980 (2840 to 3860) mg/kg body weight was ascertained, whereas the LD_{50} determined for female rats was 3550 (2920 to 4320) mg/kg body weight. For both sexes together, the LD_{50} was 3310 (2940 to 3810) mg/kg body weight. Findings included motor disturbances and lethargy as well as decreased respiratory rate, narrow palpebral fissures, lacrimation, bloody encrustations of the edges of the eyelids and the noses, tremor, reduced to absent righting reflex and poor general condition. The signs of intoxication were reversible in the male and female rats 3 and 6 days after dosing, respectively. At necropsy of the deceased animals, the findings included gastrointestinal haemorrhages and blood in the urine, discoloration of the stomach, liver, lung, pancreas and spleen, white deposits in the intestines and in the urinary bladder as well as congestion of the lung. Necropsy of the rats sacrificed at the end of the observation period revealed no noticeable findings (Hoechst, 1986 a).

7.3 Skin and mucous membrane effects

The skin irritancy of chloro-p-xylene (> 99% pure) was tested in accordance with OECD guideline No. 404. For this purpose, 3 New Zealand rabbits (weighing 2.3 to 2.7 kg) were treated with approx. 500 mg undiluted test substance (0.5 ml) as a single 4-hour semi-occlusive application to the mechanically depilated dorsal skin. The skin reactions were scored 30 to 60 minutes, 24, 48 and 72 hours as well as 7 and 14 days after the end of exposure. Thirty minutes to 72 hours after patch removal, the animals showed barely perceptible to clearly circumscribed erythema as well as very slight to slight swelling. Seven days after application, the surface of the skin of two animals was hardened and bulged out. In addition, these animals exhibited clearly circumscribed erythema. The third animal had clearly circumscribed erythema, mild oedema as well as a dry and chapped surface of the skin. In all animals, the skin displayed large areas with light-brown discoloration and had coarse scales on the surface. The irritation was re-

versible after 14 days. One animal exhibited a dry, chapped surface and pink coloration of the skin. After 24 to 72 hours, the mean score observed for erythema and escar formation was 1.9, while that for oedema formation was 1.4. Therefore, chloro-p-xylene proved to be irritating to the skin in this study (Hoechst, 1986 b).

The eye irritancy of chloro-p-xylene (99% pure) was tested in 3 albino New Zealand rabbits (weighing from 2.7 to 3.4 kg) in accordance with OECD guideline No. 405. Following a single instillation of 100 µl into the conjunctival sac the reactions were assessed after 1, 24, 48 and 72 hours and after 7 days. In order to test for potential damage to the cornea, one drop of 0.01-percent sodium fluorescein solution was instilled at the inspections carried out after 24 and 72 hours and after 7 days. One hour upon application the conjunctivae showed slight swelling as well as marked hyperaemia. After 24 hours the animals displayed marked injection of the conjunctival blood vessels. One animal had slight conjunctival swelling in addition. From 48 to 72 hours following instillation, marked hyperaemia of the conjunctival blood vessels also occurred. The signs of irritation were accompanied by ocular discharge in some instances. After 7 days, all signs of irritation were reversible. After 24, 48 and 72 hours, the mean scores observed for reddening of the conjunctiva, conjunctival swelling, clouding of the cornea and iritis were 1.0, 0.1, 0 and 0, respectively. Chloro-p-xylene was evaluated as not irritating to the eye according to EC directive No. 83/467/EEC (Hoechst, 1986 c).

7.4 Sensitisation

No information available.

7.5 Subchronic and chronic toxicity

No information available.

7.6 Genotoxicity

7.6.1 In vitro

No information available.

7.6.2 In vivo

No information available.

7.7 Carcinogenicity

No information available.

7.8 Reproductive toxicity

No information available.

7.9 Effects on the immune system

No information available.

7.10 Neurotoxicity

No information available.

7.11 Other effects

In view of reports that various hydrocarbons induced hyaline droplet accumulation in the renal cortex of male rats with subsequent nephrotoxicity and nephrocarcinogenicity, a test series was conducted to investigate chloro-p-xylene and other chemicals with respect to hyaline droplet induction. Five male Wistar rats with a body weight in the range from 220 to 240 g were treated daily with undiluted chloro-p-xylene at 250 mg/kg body weight, administered by oral gavage for 5 days. The controls received peanut oil. Two to 3 hours after the last dose, the animals were sacrificed and gross sections of the kidneys were stained and semiquantitatively graded for hyaline droplets in the proximal tubules. Furthermore, homogenised kidney sections subjected to centrifugation, one-dimensional electrophoresis and quantitative densitometric evaluation were found to contain a protein an $\alpha_{2\mu}$-globulin derivative of molecular weight 16000 D, which is characteristic of hyaline droplet formation. The mean protein amount determined for the animals treated with chloro-p-xylene was 3.30 ± 0.63 µg, while it was

2.45 ± 0.39 µg in the control group (no information on statistical significance). In 1 or 2 animals (no precise details), an increase in hyaline droplets was noted. The mean hyaline droplet scores ascertained for the chloro-p-xylene group and the control group showed no significant difference (control 2.0, chloro-p-xylene 1.8). The authors suggested that chloro-p-xylene might be classified as possessing weak or questionable activity (Bomhard et al., 1991).

8 Experience in humans

No information available.

9 Classifications and threshold limit values

No information available.

References

Bomhard, E., Marsmann, M., Rühl-Fehlert, C., Schade-Lehn, R., Schüürmann, G.
Screening of aromatic compounds for their potency of inducing hyaline droplet accumulation in male rat kidney
In: Bach, P.H. et al. (eds.)
Nephrotoxicity: mechanisms, early diagnosis, and therapeutic management, p. 273–278
Marcel Dekker, New York, Basel (1991)

Hoechst AG, Pharma Forschung Toxikologie und Pathologie
Chlor-p-xylol D – Prüfung der akuten oralen Toxizität an der männlichen und weiblichen Wistar-Ratte
Unpublished report No. 86.1471 (1986 a)

Hoechst AG, Pharma Forschung Toxikologie und Pathologie
Chlor-p-xylol D – Prüfung auf Hautreizung am Kaninchen
Unpublished report No. 86.1381 (1986 b)

Hoechst AG, Pharma Forschung Toxikologie und Pathologie
Chlor-p-xylol D – Prüfung auf Augenreizung am Kaninchen
Unpublished report No. 86.1335 (1986 c)

Hoechst AG
Written communication to BG Chemie of 23.01.1987

Lide, D.R., Frederikse, H.P.R. (eds.)
CRC handbook of chemistry and physics
77th ed., p. 3-33
CRC Press, Boca Raton, New York, London, Tokyo (1996)