

## 2-Methyl-4-chlorophenoxyacetic acid (MCPA); CASRN 94-74-6

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

### STATUS OF DATA FOR MCPA

File First On-Line 01/31/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	08/28/1987
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	not evaluated	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

### I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — 2-Methyl-4-chlorophenoxyacetic acid (MCPA)

CASRN — 94-74-6

Last Revised — 08/28/1987

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an

elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

### I.A.1. Oral RfD Summary

Critical Effect	Experimental Doses*	UF	MF	RfD
<b>Kidney and liver toxicity</b>	NOEL: 6 ppm (0.15mg/kg/day)	300	1	5E-4 mg/kg/day
<b>1-Year Dog Feeding Study</b>	LEL: 30 ppm (0.75 mg/kg/day)			
<b>Industry Task Force on MCPA, 1986a</b>				

\*Conversion Factors -- 1 ppm = 0.025 mg/kg/day (assumed dog food consumption)

### I.A.2. Principal and Supporting Studies (Oral RfD)

Industry Task Force on MCPA Research Data. 1986a. MRID No. 00152152, 00164352. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Oral administration of technical MCPA to male and female beagle dogs (6/sex/dose) at doses of 0, 6, 30, or 150 ppm (0, 0.15, 0.75, or 3.75 mg/kg/day) for 52 weeks resulted in kidney and liver toxicity at the mid- and/or high-dose levels, with alterations in clinical chemistries (kidneys: urea, potassium, creatinine; liver: bilirubin, GPT, GOT, triglycerides, and cholesterol) associated with concomitant organ weight changes (liver) and histopathology changes (kidney: increased kidney pigment deposition in proximal tubular epithelium; liver: change in the nature/coloration of gall fluid). Therefore, based upon kidney and liver toxicity at the 30 and 150 ppm dose levels, the LEL for systemic toxicity is 30 ppm (0.75 mg/kg/day). The NOEL for systemic toxicity is 6 ppm (0.15 mg/kg/day).

### **I.A.3. Uncertainty and Modifying Factors (Oral RfD)**

UF — An uncertainty factor of 100 was used to account for the inter- and intraspecies differences. An additional UF of 3 was used to account for the lack of a complete database on chronic toxicity (chronic rat and mouse study, and teratogenicity in two species).

MF — None

### **I.A.4. Additional Studies/Comments (Oral RfD)**

Data Considered for Establishing the RfD

- 1) 1-Year Feeding - dog: Principal study - see previous description; core grade minimum
- 2) 90-Day Feeding - rat: NOEL=50 ppm (2.5 mg/kg/day); LEL=150 ppm (7.5 mg/kg/day) (increased absolute and relative kidney weights in mid- and high- dose males, but not females; this was associated with a significant decrease in serum calcium in high-dose males and a significant elevation in creatinine concentrations in high-dose females. Both sexes had apparent crystaluria (oxalate, calcium phosphate, urate) in the high-dose groups. Hepatotoxicity is also suggested in high-dose males based on prolonged clotting times and decreased cholesterol concentrations); core grade minimum (Industrial Task Force on MCPA Research Data, 1985)
- 3) 2-Generation Reproduction - rat: NOEL=150 ppm (7.5 mg/kg/day); LEL=450 ppm (22.5 mg/kg/day) (HDT; small but statistically significant depression in male and/or female pup weights/pup weight gains by days 14 and 21 of weaning in all littering groups [F1a, F1b, F2a, F2b], which may indicate a potential delayed postnatal growth effect); core grade minimum (Industrial Task Force on MCPA Research Data, 1986b)

Other Data Reviewed:

- 1) 90-Day Feeding - dog: NOEL=1 mg/kg/day; LEL=3 mg/kg/day; Severe toxicity and mortality occurred at 48 mg/kg/day (HDT). There was evidence of dose- related liver and kidney toxicity (changes in serum enzymes, decreased ability to filter dyes, bromosulphalein serum retention [BSP] and phenolsulfonphthalein retention [PSP]), in both sexes at dose levels down to 3 mg/kg/day. These effects were associated with kidney and liver histopathology changes in the 12 and 48 mg/kg/day dose groups]; core grade minimum (Industrial Task Force on MCPA Research Data, 1980)

Data Gap(s): Chronic Rat Feeding Study, Chronic Mouse Feeding Study, Rat Teratology Study, Rabbit Teratology Study

### **I.A.5. Confidence in the Oral RfD**

Study — High  
Database — Medium  
RfD — Medium

The critical study is of good quality and is given a high confidence rating. Since chronic studies in rats and mice are lacking, the database is given a medium confidence rating. Medium confidence in the RfD follows.

### **I.A.6. EPA Documentation and Review of the Oral RfD**

Pesticide Registration Standard, June 1988

Pesticide Registration Files

Agency Work Group Review — 07/22/1985, 03/18/1987, 06/22/1988

Verification Date — 06/22/1988

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for 2-Methyl-4-chlorophenoxyacetic acid conducted in September 2002 identified one or more significant new studies. IRIS users may request the references for those studies from the IRIS Hotline at [hotline.iris@epa.gov](mailto:hotline.iris@epa.gov) or (202)566-1676.

### **I.A.7. EPA Contacts (Oral RfD)**

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) or [hotline.iris@epa.gov](mailto:hotline.iris@epa.gov) (internet address).

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### **I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)**

Substance Name — 2-Methyl-4-chlorophenoxyacetic acid (MCPA)  
CASRN — 94-74-6

Not available at this time.

## **II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — 2-Methyl-4-chlorophenoxyacetic acid (MCPA)  
CASRN — 94-74-6

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

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**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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## **VI. Bibliography**

Substance Name — 2-Methyl-4-chlorophenoxyacetic acid (MCPA)  
CASRN — 94-74-6  
Last Revised — 03/01/1991

### **VI.A. Oral RfD References**

THP Committee, MCPA Task Force. 1980. MRID No. 00158842. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Industry Task Force on MCPA Research Data. 1986a. MRID No. 00152152, 00164352. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Industry Task Force on MCPA Research Data. 1985. MRID No. 00165471. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Industry Task Force on MCPA Research Data. 1986b. MRID No. 40041701. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

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## VI.B. Inhalation RfC References

None

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## VI.C. Carcinogenicity Assessment References

None

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## VII. Revision History

Substance Name — 2-Methyl-4-chlorophenoxyacetic acid (MCPA)

CASRN — 94-74-6

Date	Section	Description
08/28/1987	I.A.	New study - RfD changed
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.

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## VIII. Synonyms

2-Methyl-4-chlorophenoxyacetic acid (MCPA)

CASRN — 94-74-6

Last Revised — 01/31/1987

- 2M-4C
- 2M-4CH
- 2M-4KH
- 4K-2M
- 94-74-6
- AGRITOX
- AGROXON
- AGROXONE

- ANICON KOMBI
- ANICON M
- BH MCPA
- BORDERMASTER
- BROMINAL M PLUS
- B-SELEKTONON M
- 4-CHLORO-*o*-CRESOXYACETIC ACID
- (4-CHLORO-2-METHYLPHENOXY)-ACETIC ACID
- 4-CHLORO-*o*-TOLOXYACETIC ACID
- ((4-CHLORO-*o*-TOLYL)OXY)ACETIC ACID
- CHWASTOX
- CORNOX-M
- DICOPUR-M
- DICOTEX
- DIKOTES
- DIKOTEX
- EMCEPAN
- EMPAL
- HEDAPUR M 52
- HEDAREX M
- HEDONAL M
- HORMOTUHO
- HORNOTUHO
- KILSEM
- KREZONE
- LEGUMEX DB
- LEUNA M
- LEYSPRAY
- LINORMONE
- M 40
- MCP
- MCPA
- 2,4-MCPA
- MEPHANAC
- METAXON
- METHOXONE
- Methyl-4-chlorophenoxyacetic acid, 2-
- 2-METHYL-4-CHLORPHENOXYESSIGSAEURE
- NETAZOL
- OKULTIN M
- PHENOXYLENE PLUS
- PHENOXYLENE SUPER
- RAPHONE
- RAZOL DOCK KILLER
- RHOMENC

- RHOMENE
- RHONOX
- SEPPIC MMD
- SHAMROX
- SOVIET TECHNICAL HERBICIDE 2M-4C
- TRASAN
- USTINEX
- VACATE
- VERDONE
- VESAKONTUHO MCPA
- WEEDONE MCPA ESTER
- WEED-RHAP