# Nitrapyrin

| CAS number: | 1929-82-4 |
| --- | --- |
| Synonyms: | 2-Chloro-6-(trichloromethyl)pyridine, n-serve, α,α,α, 6-tetrachloro-2-picoline |
| Chemical formula: | C6H3Cl4N |
| Structural formula: | — |

Workplace exposure standard (amended)

| TWA: | **—** |
| --- | --- |
| STEL: | **—** |
| Peak limitation: | **—** |
| Notations: | **Carc. 2., Sk., DSEN** |
| IDLH: | **—** |
| **Sampling and analysis:** N/A | |

## Recommendation and basis for workplace exposure standard

This chemical has been nominated for removal from the *Workplace exposure standards for airborne contaminants* due to a lack of evidence that it is used or generated in Australian workplaces or that it presents a potential for legacy exposure. Therefore, a TWA is not recommended.

## Discussion and conclusions

Nitrapyrin is primarily used as a fertiliser, bactericide and as a nitrification inhibitor. There is lack of evidence that this chemical is used or generated in Australian workplaces or that it presents a potential for legacy exposure.

The critical effects of exposure are liver effects including bile duct hyperplasia and histological changes.

There are limited toxicological data and no human exposure data are available. No adverse effects were observed at 15 mg/kg/day in a sub-chronic oral study in rats (ACGIH 2018). Bile duct hyperplasia was reported at concentrations as low as 30 ppm in a two-year feeding study in rats, (ACGIH 2018).

This chemical has been nominated for removal from the WES list. A TWA is not recommended.

## Recommendation for notations

Classified as a category 2 carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Classified as a skin sensitiser and not a respiratory sensitiser according to the GHS.

A skin notation is recommended based on evidence suggesting potential dermal absorption and adverse systemic effects in animals.

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 1991 TWA: 10 mg/m3; STEL: 20 mg/m3 | |
|  |
| ACGIH 2001 TLV-TWA: 10 mg/m3; TLV-STEL: 20 mg/m3 |
| TLV-TWA and TLV-STEL is recommended to minimise the risk of bile duct hyperplasia in exposed workers.  Summary of data:  Due to the lack of studies available for review TLV-TWA and TLV-STEL is recommended to provide a wide margin of safety (no further information provided).  Animal data:   * LD50: 710–940 mg/kg (mice, rats, rabbits, oral) * LD50: 850 mg/kg (rabbits, dermal) * No observable adverse effects reported at 15 mg/kg/d (dogs, rats, 93 d, oral) * Exposure at 0, 30, 100, 300 and 1,000 ppm (2 yr, feeding study) caused bile duct hyperplasia in female rats at all concentrations; reduction in body weight in 12 months in male rats. No further information.   Insufficient data to recommend a skin or sensitiser notation. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN 2002 TWA: 10 mg/m3 |
| The committee concludes that there is insufficient information to comment on the present administrative TWA, with toxicological information too poor to recommend a health based OEL (HBROEL).   * Positive results in mutagenicity assays in *S. typhimurium strains* TA97, TA98 and TA100 with rat or hamster liver metabolic activation but negative without and negative in TA1535 strain * Exposure at 0, 5, 15 and 50 mg/kg/d (rats, GD 6–15, oral) did not cause reproductive toxicity symptoms; high doses produced slight histological changes in the livers. |

### Secondary source reports relied upon

| Source |  | Year | Additional information |
| --- | --- | --- | --- |
| ECHA |  | 2018 | * LD50: <252 mg/kg (guinea pigs, oral) * LC50: >3,510 mg/m3 (rats, 4 h) * LD50: >2,000 mg/kg (rabbits, dermal) * Inconsistent results in skin sensitisation study on rats and guinea pigs * Negative results in *In vivo* and *In Vitro* genotoxicity assays * NOAEL: 20 mg/kg/d (rats, 2 yr, oral) based on three carcinogenicity studies of 2 yr duration. |

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is not a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | NA |
| HCIS | Carcinogenicity – category 2, Skin sensitisation – category 1 |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | Carcinogenicity – A4 |
| DFG | NA |
| SCOEL | NA |
| HCOTN | NA |
| IARC | NA |
| US NIOSH | NA |

NA = not applicable (a recommendation has not been made by this Agency); — = the Agency has assessed available data for this chemical but has not recommended any notations

### Skin notation assessment

| Calculation |
| --- |
| |  |  |  |  | | --- | --- | --- | --- | | Adverse effects in human case study: | no |  |  | | Dermal LD50 ≤1000 mg/kg: | yes | 3.00 |  | | Dermal repeat-dose NOAEL ≤200 mg/kg: |  |  |  | | Dermal LD50/Inhalation LD50 <10: | yes | 3.00 |  | | *In vivo* dermal absorption rate >10%: |  |  |  | | Estimated dermal exposure at WES >10%: |  |  |  | |  |  | 3 | **consider assigning a skin notation** | |

### IDLH

| Is there a suitable IDLH value available? | No |
| --- | --- |

## Additional information

| Molecular weight: | 230.93 |
| --- | --- |
| Conversion factors at 25°C and 101.3 kPa: | 1 ppm = Number mg/m3; 1 mg/m3 = Number ppm |
| This chemical is used as a pesticide: |  |
| This chemical is a biological product: |  |
| This chemical is a by-product of a process: |  |
| A biological exposure index has been recommended by these agencies: | ACGIH  DFG  SCOEL |

## Workplace exposure standard history

| Year | Standard |
| --- | --- |
| Click here to enter year |  |

## References

American Conference of Industrial Hygienists (ACGIH®) (2018) TLVs® and BEIs® with 7th Edition Documentation, CD-ROM, Single User Version. Copyright 2018. Reprinted with permission. See the [*TLVs® and BEIs® Guidelines section*](http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations) on the ACGIH website.

European Chemicals Agency (ECHA) (2018) Nitrapyrin – REACH assessment.

Health Council of the Netherlands (HCOTN) (2002) 2-Chloro-6-(trichloromethyl)pyridine (nitrapyrin). Health-based reassessment of administrative occupational exposure limits. The Hague: Health Council of the Netherlands; publication no. 2000/15OSH/032.