# 2-N-Dibutylaminoethanol

| CAS number: | 102-81-8 |
| --- | --- |
| Synonyms: | Bu2AE, DBAE, dibutylaminoethanol,  2-dibutylaminoethanol, 2-di-n-butylaminoethanol,  2-n-dibutylaminoethanol, N,N-di-n-butylaminoethanol, beta-n-dibutylaminoethyl alcohol,  N,N-dibutyl-N-(2-hydroxyethyl)amine |
| Chemical formula: | C10H23NO |

Workplace exposure standard (amended)

| TWA: | **0.5 ppm (3.5 mg/m3)** |
| --- | --- |
| STEL: | — |
| Peak limitation: | — |
| Notations: | **Sk.** |
| IDLH: | — |
| **Sampling and analysis:** The recommended value is quantifiable through available sampling and analysis techniques. | |

## Recommendation and basis for workplace exposure standard

A TWA of 0.5 ppm (3.5 mg/m3) is recommended to protect for inhibition of acetylcholinesterase (AChE) activity within the nervous system and irritation of the nose and eyes in exposed workers.

## Discussion and conclusions

2-N-dibutyl-aminoethanol (DBAE) is commonly used in industry as an emulsifying, flotation and curing agent as well as a dispersant and absorbant. It is also used as a conditioning agent for textile manufacturing a catalyst in polyurethane foam manufacture and as a anti-corrosion additive.

No evidence in humans is available. Critical effects of exposure in animals include irritation of the eyes and nose, inhibition of AChE, tremors, convulsions and neuromuscular blockage leading to respiratory arrest. A NOEC of 22 ppm is reported in a six month inhalation study in rats. Exposure at 70 ppm over six hours a day reported eye and nasal irritation in rats (ACGIH, 2018).

Using the NOEC of 22 ppm in rats as a starting point and applying an uncertainity factor of 40 to account for inter- and intra species differences and the potency of DBAE on cholinesterase activity, results in a recommended TWA of 0.5 ppm. This concentration is considered to be protective of systemic effects. While ACGIH (2018) note that information is unavailable to judge if the TLV-TWA will protect for eye and nasal irritation, the recommended TWA is significantly below the concentration reported to result in irritation and other systemic effects.

## Recommendation for notations

Not classified as a carcinogen according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Not classified as a skin sensitiser or respiratory sensitiser according to the GHS.

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

# Appendix

### Primary sources with reports

| Source Year set Standard |
| --- |
| SWA 2018 TWA: 2 ppm (14 mg/m3) | |
|  |
| ACGIH 2001 TLV-TWA: 0.5 ppm (3.5 mg/m3) |
| TLV-TWA recommended to minimise the potential for eye and nasal irritation and inhibition of AChE.  Summary of data:  No human data presented.  Animal data:   * LD50: 1.78 g/kg (rats, oral) * LD50: 0.089–0.144 g/kg (rats, IP) * LD50: 1.44 g/kg (rabbits, dermal) * NOEC: 22 ppm (rats, inhalation, 6 h/d, 27 wk) * Skin exposure in rabbits within 24 h produced symptoms of necrosis * Eye exposure in rabbits within 24 h produced symptoms of corneal necrosis * Rats exposed presented symptoms of convulsions and neuromuscular blockage due to increased CNS activity resulting in respiratory arrest and ultimately resulting in death * Median effective dose of 50.6 mg/kg and median lethal dose of 89.1 mg/kg (rats) * The test animals were able to survive doses of up to 500 mg/kg if artificial respiration was used to counteract the respiratory arrest * Exposure in rats increased gastric motility and secretory activity, decreased respiratory and heart rates, chromodacryorrhea (shedding of bloody tears) and excessive salivation * Weight loss in rats (5 male and 5 female) presented on ingestion of 0.13 g/kg/d (water and food) * Inhalation exposure of 5 rats over 6 h/d for 1 wk at 70 ppm resulted in eye and nasal irritation, chromodacryorrhea, tremors, convulsions and death of 1 rat on day 4 * on average 57% presented with bw loss, 2-fold increase in liver and kidney-to-body weight ratios, 10‑fold increase in total serum bilirubin, a marginal increase in clotting time and no change in serum bilirubin or haematocrit * Inhalation exposure of 5 rats 6 h/d for 5 d at 33 ppm resulted in growth failure but no mortality.   Skin notation based on LD50 of 1.44 g/kg in rabbits.  Insufficient data available to recommend a sensitiser notation or a STEL. |
| DFG NA NA |
| No report. |
| SCOEL NA NA |
| No report. |
| OARS/AIHA NA NA |
| No report. |
| HCOTN NA NA |
| No report. |

### Secondary source reports relied upon

NIL.

### Carcinogenicity — non-threshold based genotoxic carcinogens

| Is the chemical mutagenic? | No |
| --- | --- |
| **The chemical is a non-threshold based genotoxic carcinogen.** |  |

## Notations

| Source | Notations |
| --- | --- |
| SWA | Skin |
| HCIS | NA |
| NICNAS | NA |
| EU Annex | NA |
| ECHA | NA |
| ACGIH | Skin |
| 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: | no |  |  | | Dermal repeat-dose NOAEL ≤200 mg/kg: | yes | 3.00 |  | | Dermal LD50/Inhalation LD50 <10: |  |  |  | | *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: | 173.29 |
| --- | --- |
| 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

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