1-DECENE

Document History
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I. IDENTIFICATION[1-6]

Chemical Name: 1-Decene
Synonyms: Decylene, C10 alpha olefin, alpha-decene
CAS Number: 872–05–9
Molecular Formula: $C_{10}H_{20}$
Structural Formula: CH_2=CH–$(CH_2)_7$–CH_3
Major impurities (up to 7%) include C_9–C_{11} hydrocarbons

II. CHEMICAL AND PHYSICAL PROPERTIES[1-6]

Physical State: Colorless liquid
Odor Description and Threshold: Mild pleasant odor; ≅7 ppm
Molecular Weight: 140.27
Conversion Factors: 1 ppm = 5.74 mg/m^3
1 mg/m^3 = 0.174 ppm
Melting Point: -66.3°C (-87.3°F)
Boiling Point: 170–171°C (338–340°F)
Vapor Pressure: 1.7 mmHg at 20°C (68°F)
Saturated Vapor Concentration: 2237 ppm (calculated)
Flammability Limits: LEL = 0.5%; UEL = 5.4%
Vapor Density: 4.84
Flash Point (closed cup): 46°C (114.8°F)
Autoignition Temperature: 244°C (471.20°F)
Specific Gravity: 0.741 at 20°C (68°F)
Solubility in Water: Negligible
Stability: Stable
Reactivity and Incompatibilities: Reacts when exposed to catalysts producing internal olefins and/or dimers, trimers, or higher oligomers. Contact with oxygen results in slow formation of hydroperoxides, which can decompose to carbonyl-containing impurities. UV-light increases the hydroperoxide formation.

III. USES AND VOLUMES[3,4]

Use categories for 1-decene include dyestuffs, intermediates, solvents, adhesives, building materials agents, detergents, cleaning agents, fertilizers, plastic agents, and surface treatment agents. Also used in chemical manufacturing as an intermediate in the production of polyalpha-olefin synthetic lubricants, primary alcohols, flavors, perfumes, pharmaceuticals, dyes, oils, and resins. Production ranges from 100–250 thousand metric tonnes (1990 estimate).

IV. ANIMAL TOXICOLOGY DATA

A. Acute Toxicity and Irritancy:

1. *Oral Toxicity*

LD_{50} (rat) > 10 g/kg[7]

2. *Eye Irritation*

Practically non-irritating to the eyes of rabbits[7]

3. *Skin Absorption*

LD_{50} (rabbit) > 10 g/kg[7]

4. *Skin Irritation*

Practically non-irritating to the skin of rabbits.[7]

5. *Skin Sensitization*

No data found for 1-decene. C_{10}–C_{13} cracked wax alpha olefins and C_{12}–C_{16} blend alpha olefins were non-sensitizing in the guinea pig maximization test (GPMT).[3,7]

6. *Inhalation Toxicity*

No deaths were reported when animals were exposed to a saturated vapor concentration for up to 4 hr. The only sign of toxicity observed was lethargy; however, this was rapidly reversible upon cessation of exposure. The low level of acute toxicity via the inhalation route is consistent with that observed with other C_6–C_{12} alkenes, including 1-hexene. The high partition coefficients

VII. RECOMMENDED OEL

8-hr time-weighted average (TWA): 100 ppm (574 mg/m^3)

VIII. REFERENCES

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