**SIDS INITIAL ASSESSMENT PROFILE**

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>103-09-3</th>
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<tbody>
<tr>
<td>Chemical Name</td>
<td>2-Ethylhexyl Acetate</td>
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<tr>
<td>Structural Formula</td>
<td>CH3-C(=O)-CH-CH(CH2-CH3)-CH2-CH2-CH2-CH3</td>
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**SUMMARY CONCLUSIONS OF THE SIAR**

**Analogue Rationale**

Several of the health endpoints for 2-ethylhexyl acetate that are dependent upon systemic exposure make use of data from 2-ethylhexanol experiments. Acetate esters of primary alcohols undergo rapid hydrolysis, catalyzed by esterases and proteases found in mammalian tissues and gastric fluids. The rapid and complete hydrolysis of 2-ethylhexyl acetate to 2-ethylhexanol has been demonstrated to occur in vitro within blood (half life of 2.3 minutes) and in vivo. The use of 2-ethylhexanol studies to identify hazards associated with 2-ethylhexyl acetate exposure are limited to toxicity endpoints dependent upon systemic exposure (e.g. repeated exposure, reproductive and developmental toxicity carcinogenicity) and not for direct exposure to the parent compound (e.g. eye and skin irritation). Therefore, toxicity data from studies conducted with 2-ethylhexanol have been used to identify the these hazards associated with 2-ethylhexyl acetate exposures.

**Physical-Chemical Properties**

2-Ethylhexyl acetate is a liquid at standard temperature and pressure, with a boiling point of 199 °C and a melting (freezing) point of –93 °C. It is less dense than water with a specific gravity of 0.8718 g/cm³ at 20°C. The solubility limit in water has been measured as 3.9 mg/L at 20°C. 2-Ethylhexyl acetate is combustible with a flash point of 76 °C and a flammability range of 0.76 to 8.14% by volume. It has a vapour pressure of 0.31 hPa at 25 °C. Given its solubility limits of 3.9 mg/L at 20 °C and its molecular weight of 172.27 g/mole, the Henry's law constant at 25 °C has been calculated to be 1.51 x 10⁻³ atm-m³/mole (153.0 Pa-m³/mol). An octanol/water partitioning coefficient (Log K_{ow}) value of 3.74 has been estimated for 2-ethylhexyl acetate.

**Human Health**

The hydrolysis of 2-ethylhexyl acetate to 2-ethylhexanol is rapid as demonstrated with in vitro and in vivo experiments. The subsequent metabolism of 2-ethylhexanol to 2-ethylhexaldehyde is presumed to occur with subsequent oxidation of the aldehyde intermediate to 2-ethylhexanoic acid. Metabolism and toxicokinetics studies with 2-ethylhexanol have demonstrated the presence of 2-ethylhexanoic acid in the plasma as well as glucuronide conjugates and oxidation products of 2-ethylhexanoic acid metabolism in the urine following intravenous, dermal and oral exposures. Elimination of 2-ethylhexanol metabolites following oral exposure was complete within 24 hours. Comparison of 2-ethylhexanol and 2-ethylhexanoic acid metabolic/toxicokinetics information and toxicity databases suggests that the metabolic processes necessary to convert 2-ethylhexanol to 2-ethylhexanoic acid explain the difference in toxicity of these chemicals. 2-Ethylhexanol toxicity information is most relevant for 2-ethylhexyl acetate hazard identification since 1) 2-ethylhexanol is the product of the initial hydrolysis reaction of 2-ethylhexyl acetate and 2) the limited toxicity information for 2-ethylhexyl acetate suggests a similar toxicity profile with 2-ethylhexanol. Metabolism data in humans for 2-ethylhexyl acetate is not available.

The oral LD₅₀ value for 2-ethylhexyl acetate is >3200 mg/kg bw in rats and mice, with weakness and ataxia reported at this dose level. The dermal LD₅₀ in rabbits is >20 ml/kg (17,436 mg/kg bw); the substance was applied undiluted and under occlusion for 24 hours followed by a 10-day observation.
Ethylhexanol is not considered a reproductive toxicant based on data from repeated exposure studies. No reproductive or developmental toxicity studies were available for 2-ethylhexyl acetate. 2-Ethylhexanol is not considered a reproductive toxicant based on data from repeated exposure studies as well as in vitro investigations. 2-Ethylhexanol causes developmental toxicity (reduced foetal body weights (-9.5%), a single type of skeletal vertebral malformation, reduced skeletal ossification) in rats only at oral dose levels of 650 mg/kg bw/day (861 mg/kg bw/day for 2-ethylhexyl acetate), a dose level causing significant maternal toxicity. The highest dose level (1300 mg/kg bw) caused significant maternal toxicity. The highest dose level (1300 mg/kg bw) caused
maternal deaths, reduced feed consumption and body weight gain in the dams, increased resorptions, foetal death and decreased foetal weights and malformations in the surviving foetuses. 2-
Ethylhexanol is not a developmental toxicant via the dermal (up to 2,520 mg/kg bw/day) or inhalation
routes of exposure (up to 0.85 mg/L) in rats. There were no treatment-related histological changes in
either the testes or ovaries (in mice and rats) after 13 weeks of treatment with 2-ethylhexanol at
dosages up to 500 mg/kg bw/day.

2-Ethylhexyl acetate possesses properties indicating a hazard for human health (mild skin and eye
irritation). Adequate screening-level data are available to characterize the hazard for the human health
purposes of the OECD HPV Programme.

Environment

In the atmosphere, indirect photo-oxidation by reaction with hydroxyl radicals is predicted to occur
with an estimated half-life of 11,723 hours. Abiotic hydrolysis is predicted to occur with an estimated
half-life of 121 days at pH 8 and 3.3 years at pH 7. A 28-day aerobic test, OECD TG 301B, using 2-
ethylhexyl acetate, was conducted using municipal wastewater activated sludge. Biodegradation was
16%, 49%, 66%, and 70% after 3, 7, 12, and 28 days, respectively. These data indicate the material
is readily biodegradable.

Fugacity modelling (Level III) was conducted for 2-ethylhexyl acetate. The resulting distributions are
7.65% to air, 25.7% to water, 65.4% to soil and 1.23% to sediment. Using the log K_{ow} of 3.74, a BCF
of 151 was calculated for 2-ethylhexyl acetate.

The Henry’s law constant is 1.51 X 10^{-3} atm-cu m/mole at 25°C. This value suggests that volatilization of 2-ethylhexyl acetate from the water phase is not expected to be significant. The K_{oc}
of 2-ethylhexyl acetate is estimated at approximately 222, which suggests that 2-ethylhexyl acetate
has moderate mobility in soil.

The critical study that evaluated the toxicity of 2-ethylhexyl acetate to fish was conducted in a 96
hour static-renewal assay with Oncorhyncus mykiss. The study used a water accommodated fraction
(WAF) with measured concentrations of 0, 0.284, 0.57, 1.34 or 2.51 mg/L. The 96-h LC50 was
reported as 8.27 mg/L.

The critical study that evaluated the toxicity of 2-ethylhexyl acetate to aquatic invertebrates was
conducted with Daphnia magna using static-renewal 48 hour exposure according to OECD TG 202.
The study used a WAF with measured concentrations of 0, 0.828, 2.06, 4.12, 7.99, or 15.7 mg/L. The
48-hour EC50 for immobilization of Daphnia magna is 22.9 mg/L.

Results are available from a 72 hour growth inhibition study in green algae (Pseudokirchneriella
subcapitata, formerly known as Selenastrum capricornutum). The study used a WAF with measured
centers of 0, 1.42, 2.70, 5.27, 10.3, or 21.0 mg/L. The 72-hour EC50 for growth inhibition for
2-ethylhexyl acetate was >21.9 mg/L, and the NOEC growth inhibition was 10.3 mg/L.

2-Ethylhexyl acetate possesses properties indicating a hazard for the environment (acute aquatic
toxicity values between 1 and 100 mg/L). The chemical is readily biodegradable and has a low
bioaccumulation potential. Adequate screening-level data are available to characterize the hazard for
the environment for the purposes of the OECD HPV Programme.

Exposure

2-Ethylhexyl acetate had a production and/or import volume in the United States between 454 and
4,540 tonnes during 2005. 2-Ethylhexyl acetate is produced by the esterification of 2-ethylhexanol
with acetic acid. Virtually all of the 2-ethylhexyl acetate produced is used as a solvent in the
manufacture of various types of industrial and consumer paints and coatings. Minor use as a
component of fragrances is also reported. No monitoring data within production and processing sites
in the United States are available. It has a low odour threshold (0.007 ppm) and a sweet odour. 2-
Ethylhexyl acetate is manufactured in an enclosed, continuous process and engineering controls and
vapour collection systems are used during production, transfer, and loading operations. These
measures are used to minimize workplace exposure and odour complaints. Workplace and consumer
exposure may occur via the inhalation of vapours during the application and drying of paints and
coatings containing 2-ethylhexyl acetate. Minor dermal exposure may also occur. Some consumer
exposure occurs due to the reported use of 2-ethylhexyl acetate as a component in fragrances. Scrubbers and other emission controls are usually employed to minimize release of 2-ethylhexyl acetate during manufacture and use. However, 2-ethylhexyl acetate may be released to the environment as a fugitive emission during production.