# SIDS INITIAL ASSESSMENT PROFILE

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| **CAS No.** | 141-97-9 |
| **Chemical Name** | Ethyl acetoacetate |
| **Structural Formula** | $CH_3$-C(=O)-$CH_2$-C(=O)-O-$CH_2$- $CH_3$ |

## RECOMMENDATIONS

The substance is currently of low priority for further work.

## SUMMARY CONCLUSIONS OF THE SIAR

**Human Health**

Absorption of ethyl acetoacetate via the oral route is demonstrated in animals, absorption via the lungs can be assumed.

It may be anticipated that ethyl acetoacetate is partially cleaved already in the gastrointestinal tract due to acidic pH values or by bacterial activity. In a first metabolic step the absorbed portion of ethyl acetoacetate will be hydrolysed into 3-oxobutanoic acid and ethanol by the unspecific esterases of the blood. The acid moiety is an endogenous product within the lipid metabolism and is further metabolized predominantly to carbon dioxide and water; ethanol will be metabolized on known pathways.

For predicting in humans rates of ester hydrolysis using data derived from animal studies it has to be considered that in dependence on the prevailing substrate, esterase activities in human plasma are far lower than in rats as a rule. Therefore it is to anticipate, that the stability (half-life) of systemically available ethyl acetoacetate is clearly higher in humans than in rats. The main route of elimination of ethyl acetoacetate and its metabolites is urinary excretion or exhalation of the metabolic product carbon dioxide in the breath.

Human data on acute toxicity and on local irritation caused by ethyl acetoacetate are not available. In animals, acute toxicity by the oral, dermal, and inhalative routes is low as judged by tests with rats. The substance demonstrated no or only mild skin irritation and mild eye irritation in tests with rabbits. Valid human or animal data on sensitization are not available.

Following repeated oral exposure of ethyl acetoacetate in rats, no treatment-related adverse effects (including haematology, clinical chemistry, gross necropsy and histopathology) were reported up to 1000 mg/kg bw/d. There is no information on health effects in humans following repeated exposure to ethyl acetoacetate via any route.

On the basis of the in vitro data (bacterial mutation test and chromosomal aberration assay) there is no evidence of a genotoxic potential of ethyl acetoacetate.

There are no data on cancerogenicity of ethyl acetoacetate. From experience on other comparable compounds in combination with the knowledge on the metabolites there is no reason to assume a concern regarding cancerogenic effects of the substance.

There are no human data available on toxicity for reproduction. The potential to adversely affect reproduction and development was investigated in a screening study with oral administration to rats. No relevant effects were

observed at doses up to 1000 mg/kg bw/d.

**Environment**

Ethyl acetoacetate has a water solubility of 125 g/l, a vapor pressure of 1 hPa and a log Kow of 0.25. According to the physico-chemical properties the target compartment for this substance is the hydrosphere. Ethyl acetoacetate is in principal hydrolysable, the half life for the hydrolysis in neutral solution was calculated to 149 days. The substance is classified as "readily biodegradable". There is no considerable potential for bio- or geoaccumulation. An atmospheric half-life of 10 days was calculated for this substance.

The following results from ecotoxicity tests with aquatic species are available:

In a short-term test with fish a 48h $LC_{50}$ of 275 mg/l was found for *Leuciscus idus*. For invertebrates acute studies on *Daphnia magna* had been conducted. A 24 h $EC_{50}$ between 790 and 800 mg/l were found in these tests. In a study with *Scenedesmus subspicatus* no effects could be observed after 72 h at a concentration of 500 mg/l. Long-term toxicity tests with fish and invertebrates are not available. With an assessment factor of 1000 a PNEC of 275 µg/l is determined.

**Exposure**

The production volume of Ethyl acetoacetate in the EU is ca. 2900 to 3400 t/a. Most of the Ethyl acetoacetate is used as an intermediate in chemical synthesis for the production of plant protection agents and pharmaceuticals. Less than 5 % of the chemical is used as an odour agent in household chemicals, solvent in paints and lacquers and as an additive in paper.

## NATURE OF FURTHER WORK RECOMMENDED

This substance has been agreed in the European Union Risk Assessment Program under Regulation EEC/793/93 with the following conclusion:

**Environment**: There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.

**Human Health:** There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already.