

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	150-90-3
Chemical Name	Disodium succinate
Structural Formula	NaOOCCH ₂ CH ₂ COONa

SUMMARY CONCLUSIONS OF THE SIAR**Analogue Rationale**

Disodium succinate is stable as a hexahydrate and has been produced as disodium succinate hexahydrate (CAS No.: 6106-21-4) in Japan. Many toxicity studies were conducted using disodium succinate hexahydrate as the test substance, because there should be no difference between disodium succinate and disodium succinate hexahydrate in terms of environmental behavior, aquatic toxicity, and mammalian toxicity.

Human Health

There is no available information on toxicokinetics and metabolism.

An oral acute toxicity study [OECD TG 401] of disodium succinate hexahydrate showed that this chemical did not cause any changes even at 2,000 mg/kg. The oral LD50 value was considered to be greater than 2,000 mg (equivalent to 1,200 mg of disodium succinate)/kg bw in male and female rats.

In a combined repeated dose toxicity study with the reproduction/developmental toxicity screening test [OECD TG 422], Crj: CD (SD) IGS rats were given disodium succinate hexahydrate by gavage at 0, 100, 300, or 1,000 mg/kg bw/day. Males were dosed for 52 days from day 14 before mating and females were dosed from day 14 before mating to day 4 of lactation throughout the mating and pregnancy period. Blood urea nitrogen levels were increased in females at 1,000 mg/kg bw/day. Higher levels of urinary protein were found in one and two of the five males at 300 and 1,000 mg/kg bw/day, respectively, whereas no animals with these high levels were found in the control and 100 mg/kg bw/day groups. These findings suggest adverse effects of this compound on the kidney. Therefore, the NOAEL of disodium succinate hexahydrate for repeated dose toxicity was considered to be 100 mg (equivalent to 60 mg of disodium succinate)/kg bw/day for male rats and 300 mg (equivalent to 180 mg of disodium succinate)/kg bw/day for female rats.

In a reverse gene mutation assay [OECD TG 471], disodium succinate hexahydrate was not mutagenic in *Salmonella typhimurium* TA98, TA100, TA1535, and TA1537, and *Escherichia coli* WP2 *uvrA* with and without an exogenous metabolic activation. In a chromosomal aberration test [OECD TG 473], disodium succinate hexahydrate did not induce structural chromosomal aberrations or polyploidy with and without an exogenous metabolic activation in cultured Chinese hamster lung (CHL/IU) cells.

There is no data available on the carcinogenicity.

The above-mentioned combined study [OECD TG 422] showed that the reproduction/developmental parameters, i.e., mating, pregnancy, delivery, lactation, and viability and body weight of pups, were not affected by disodium succinate hexahydrate at up to 1,000 mg/kg bw/day. The NOAEL of disodium succinate hexahydrate for reproduction/developmental toxicity was considered to be 1,000 mg (highest dose tested, equivalent to 600 mg of disodium succinate)/kg bw/day in rats.

There is no available information on eye and skin irritation and sensitization.

Environment

Disodium succinate is a white powder with a melting point of more than 400 degree C, a water solubility of more than 100 g/L. This chemical is stable at pH 4, 7 and 9 at 50 degree C for 5 days, and readily biodegradable. A vapour pressure of 1.16×10^{-5} Pa is calculated. A Log Pow of < -0.59 is estimated and the bioaccumulation potential of disodium succinate is expected to be low.

The toxicity of disodium succinate on aquatic organisms has been studied in three freshwater species belonging to three trophic levels. The toxicity tests were conducted using disodium succinate hexahydrate instead of the test substance because disodium succinate hexahydrate is not different to the test substance in aqueous solution and disodium succinate is stable as hexahydrate.

In an algal growth inhibition test (OECD TG 201, *Selenastrum capricornutum*, open system), the 72 h ErC50 and the 72 h EbC50 were >998 mg/L. For daphnids, a 48 h EC0 of 997 mg/L and a 48 h EC50 > 997 mg/L were reported (OECD TG 202, *Daphnia magna*, static). For fish (OECD TG 203, *Oryzias latipes*, flow-through) a 96 h LC0 of 47.0 mg/L, 96 h LC50 >95.4 mg/L and 96 h LC100 > 95.4 mg/L were determined.

Regarding chronic toxicity to algae, a 72 h NOErC of 998 mg/L and a NOEbC 998 mg/L (OECD TG 201, *Selenastrum capricornutum*, open system) were reported. For daphnids, the 21 d EC50 was more than 95.2 mg and a 21 d NOEC of 95.2 mg/L on reproduction and a 21 d LC50 >95.2 mg/L for parent daphnids were reported (OECD TG 211, *Daphnia magna*, semi-static).

There is no information available on toxicity to terrestrial or other organisms.

Exposure

Disodium succinate anhydrate and hexahydrate is used as a seasoning agent and raw material for plating reagent. This chemical is permitted for use as a food additive and no limit value for food additives exists in Japan. This chemical is naturally contained in shellfish. In Japan disodium succinate is being produced in its hexahydrate form and the annual production volume in Japan is ca. 3,000 tonnes.

The main target environmental compartment of this chemical is water and once it is released into the aquatic phase, partitioning to other compartments is unlikely to occur.

Occupational exposure to this chemical through inhalation and dermal routes is possible. Consumer exposure to this chemical through ingestion is possible.

RECOMMENDATION

The chemical is currently of low priority for further work.

RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

The chemical is currently of low priority for further work based on its low hazard potential.