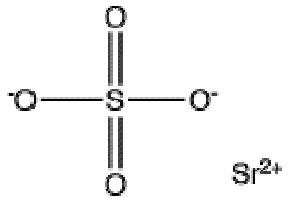
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	7759-02-6
Chemical Name	Strontium sulfate
Structural Formula	

SUMMARY CONCLUSIONS OF THE SIAR

Human Health

There are no specific toxicokinetics data for strontium sulfate.

The acute oral toxicity study [OECD TG 423] and acute dermal toxicity study [OECD TG 402] of strontium sulfate in rats showed that this chemical did not cause any significant changes in body weights at 2,000 mg/kg bw–treated rats. No clinical effects were observed by strontium sulfate after 14 days. Therefore, the acute oral and dermal LD_{50} values in rats were greater than 2,000 mg/kg bw.

There are no reliable data available for skin/eye irritation and skin sensitization of strontium sulfate.

In a repeated dose oral toxicity study in rats [OECD TG 422], strontium sulfate was administered by gavage to male for 42 days and female rats for 40 to 54 days at doses of 0, 500, 1,000 and 2,000 mg/kg bw/day. No deaths and clinical signs were observed in either sex. However, the high dose exposure of female rats resulted in reduction of reticulocyte and aspartate aminotransferase (AST) values. There were significant decreases of the spleen weights in all treated female groups (approximately 20% in all dose levels). However, this toxicological significant effect is uncertain as no dose response was observed and no histopathological findings were reported. In male rats, a significant increase in the testis weights was seen at dose of 2000 mg/kg bw/day, the NOAEL for this effect was 1,000 mg/kg bw/day. A NOAEL for repeated dose toxicity was not achieved in this study due to reduction of the spleen weight in female rats.

A bacterial reverse mutation assay [OECD TG 471] on strontium sulfate (39-1,250 μg/plate without S-9 mix and 156.3-5,000 μg/plate with S-9 mix) was negative with and without metabolic activation in *Escherichia coli* WP2 uvrA and *Salmonella typhymurium* TA1535, TA100, TA98, TA 1537. An *in vitro* chromosome aberration test using CHL/IU cells [OECD TG 473] was also negative with and without metabolic activation. Therefore strontium sulfate was not genotoxic *in vitro*. There is no data for *in vivo* genotoxicity.

There are no data regarding the carcinogenic potential of strontium sulfate.

In a reproductive/developmental toxicity screening test in rats [OECD TG 422], strontium sulfate was administered by gavage at doses of 0, 500, 1,000 and 2,000 mg/kg bw/day to males for 42 days and females from 14 days before mating to day 4 of lactation. No effect of strontium sulfate was observed on any reproductive performance (fertility, mating rate, birth rate and sex ratio and gestation period etc.) and developmental effects (malformation, etc.) up to 2,000 mg/kg bw/day. The NOAEL for reproductive /developmental toxicity was considered to be 2,000 mg/kg bw/day in rats.

Environment

Strontium sulfate is an odorless white inorganic solid. It occurs in nature as the mineral celestite or celestine. Celestite ($SrSO_4$) is the most common strontium mineral consisting of strontium sulfate. It is slightly soluble in water (135mg/L at 25 °C), slightly soluble in concentrated acids, insoluble in alcohol and dilute sulphuric acid. It

has a density of 3.96 g/cm^3.

Vapour pressure and partition coefficient in n-octanol/water, photodegradation and biodegradation are not applicable due to inorganic properties. This chemical is stable in water and the soluble fraction dissociates in the aquatic environment to strontium and sulfate ions. In acidic to near-neutral pH solutions, dissolution rate of strontium sulfate is fast.

The following studies for aquatic organisms are available:

Fish (*Oryzias latipes*) : LC_{50} (96 h) > 100 mg/L
Invertebrates (*Daphnia magna*) : EC_{50} (48 h) > 100 mg/L
Green algae (*Pseudokirchneriella subcapitata*): E_rC_{50} (72 h) > 100 mg/L (growth rate),
E_bC_{50} (72 h) > 100 mg/L (biomass)

Exposure

In Korea the imported volumes of strontium sulfate were 63,993, 61,727, and 60,158 tons in 2003, 2004, and 2005, respectively. World production volume of celestite, in the early 1990s, was estimated at ca. 250,000-300,000 tonnes per year. It has been reported that the production figures of celestite (tons) in 1991, Spain, Turkey, United Kingdom, China, Mexico, Iran, and Morocco are 70,000, 65,000, 2,000, 25,000, 90,000, 20,000, and 4,000, respectively. In Korea this chemical was used as major raw material for production of strontium carbonate ($SrCO_3$). Strontium sulfate is also employed in ceramics and pyrotechnics industry and manufacturing of paints, lacquers, vanishes, glass and paper. The environmental exposure due to dust emission is low resulting from employing bag filters and vent scrubbers to collect particles released during processing. Occupational exposure is maintained low resulting from wearing PPE (person protective equipments) required in all facilities.

RECOMMENDATIONS AND RATIONALE FOR THE RECOMMENDATION AND NATURE OF FURTHER WORK RECOMMENDED

Human Health: The chemical is of a low priority for further work. The chemical possesses a hazard for human health (repeated dose oral for female). Based on the data presented by the sponsor country (relating to the use pattern and no production in the Sponsor country), exposure to humans is anticipated low. Countries may desire to investigate any exposure scenarios that were not presented by the sponsor country.

Environment: The chemical is of low priority for further work because of its low hazard profile.