

SIDS INITIAL ASSESSMENT PROFILE

CAS No.	68186-90-3
Chemical Name	C.I. Pigment Brown 24
Structural Formula	Complex inorganic coloured pigment based on titanium oxide; in the rutile lattice, titanium ions are partially replaced by chromium (III) and antimony (V) ions. (Ti, Cr, Sb) O ₂

SUMMARY CONCLUSIONS OF THE SIAR**Category/Analogue Rationale**

In some circumstances, available data for C.I. Pigment Yellow 53 (CAS No. 8007-18-9, a nickel antimony doped rutile) may be presented to assist the weight of evidence approach for C.I. Pigment Brown 24, since it is closely related structurally and similar regarding its non-bioavailability. Its toxicological profile was also essentially similar to C.I. Pigment Yellow 53, therefore, analogy considerations can be made where the non-bioavailability is the determining parameter of non-toxicity. This was the case for reproductive and developmental toxicity.

Human Health

The acute toxicity of C.I. Pigment Brown 24 after oral exposure is negligible: oral LD50 in rats > 10000 mg/kg body weight.

C.I. Pigment Brown 24 is minimally irritating to the rabbit skin and may cause slight particle mediated irritating effects after instillation into the rabbit eye. Coloration of the skin occurred within the first 3 days after application. No data are available on sensitisation; the substance contains chromium, but no evidence for its bioavailability was seen in a repeat oral study in the rat (see below).

No signs of clinical toxicity or histopathological changes were seen in a 90-day dietary study in the rat. A NOAEL of 500 mg/kg was identified from this study. In this study there was no evidence for chromium accumulation in the liver or kidney of rats, and traces of antimony (below 30 µg/kg tissue) were found only in the high dose group. These traces of antimony may be available from the acid-soluble impurities of the pigment. The small amount of antimony is considered to have no toxicological significance.

C.I. Pigment Brown 24 induced no gene mutation in bacteria nor in mammalian cells and no clastogenic or aneugenic effects in mammalian cells with or without addition of a metabolic activation system. Therefore, the *in vitro* data indicates that C.I. Pigment Brown 24 would not exhibit a genotoxic potential *in vivo*.

There are no specific studies on carcinogenicity available.

No effects on gonads were observed in the 90 day feeding study on rats at doses of up to 500 mg/kg b.w./day (see above). A developmental toxicity study is not considered necessary because the substance showed no bioavailability with toxicological relevance after oral exposure (see above). In analogy to C.I. Pigment Yellow 53 where no reproductive or developmental effects were seen in a screening test conducted in rats tested up to 1000 mg/kg bw according to OECD Guideline 422, no effects are expected with C.I. Pigment Brown 24.

Environment

C.I. Pigment brown 24 is a solid, complex inorganic coloured pigment, based on titanium dioxide with chromium (III) and antimony (V) ions partially replacing titanium ions in the rutile lattice. It is practically inert and has a melting point above 1000°C. The vapour pressure is estimated to be negligible. C.I. Pigment brown 24 has an extremely low solubility in water; the concentration of chromium and antimony in filtrates (10 g/l) has been measured by atomic absorption to be <0.01 mg/l.

The following aquatic effect concentrations (nominal) are available:

Leuciscus idus: LC₅₀ (96 h) > 10,000 mg/l; *Daphnia magna*: EC₅₀ (48 h) > 100 mg/l; *Desmodesmus subspicatus*: EC₅₀ (72 h) > 100 mg/l; *Pseudomonas putida*: EC₅₀ (30 min) > 10,000 mg/l.

The substance is not acutely toxic to aquatic organisms (fish, invertebrates and algae) in tests with either aqueous eluates or suspensions prepared with nominal concentrations far exceeding its water solubility.

No data are available on terrestrial organisms.

The substance is inorganic and thus not biologically degradable. According to the low water solubility and the structural properties of the pigment, bioaccumulation is not expected.

Exposure

Pigment brown is used for coloring plastics, ceramics, building materials and coatings. The estimated world production amounts to 10,000 – 15,000 tonnes.

No data are available concerning exposure. Pigments released from production sites and not having been eliminated mechanically, will probably absorb to sewage sludge. In the end products, the pigments are fixed in the matrix and a release into the environment during use phase is not expected.

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 a low hazard potential.