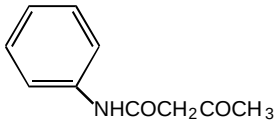
SIDS INITIAL ASSESSMENT PROFILE

CAS No.	102-01-2
Chemical Name	Acetoacetanilide
Structural Formula	

CONCLUSIONS AND RECOMMENDATIONS

Environment

The chemical is of low concern to aquatic organisms and is considered inherently biodegradable. The predicted environmental concentration is lower than the predicted no effect concentration. It is therefore currently considered of low potential risk and low priority for further work.

Health

The critical effect of this chemical is methemoglobinemia. This chemical is used as an intermediate and is produced in a closed system. Exposures at production sites are well controlled. It is therefore currently considered of low potential risk and low priority for further work.

SHORT SUMMARY WHICH SUPPORTS THE REASONS FOR THE CONCLUSIONS AND RECOMMENDATIONS

Acetoacetanilide (AAA) is a chemical intermediate used in the production of pigments. Approximately 10 000 metric tonnes are manufactured each year in a closed system. This substance is then isolated and transported under closed conditions to pigment manufacturing facilities. There is no known direct or consumer use. Non-aqueous wastes from manufacture are incinerated, and aqueous wastes are sent to a wastewater treatment facility for treatment.

Following environmental release AAA is expected to distribute in the aquatic environment, biodegradation is expected to be rapid. The predicted environmental concentration from the manufacture of AAA has been estimated to be 16 μg/L and 46 μg/L based on two different production sites. The predicted environmental concentration from pigment manufacture is estimated to be 8.6 μg/L.

The acute toxicity of AAA has been evaluated in a number of aquatic species including the fathead minnow, and several invertebrate species including *Daphnia*. In all cases the LC_{50} concentration was greater than 100 mg/L (the highest concentration tested) for the 96-hour exposure. The EC_{50} for algae of 318 mg/L was used to calculate a predicted no effect concentration of 0.32 mg/l using an assessment factor of 1000. Comparing the hypothetical $PEC_{initial}$ in water to the PNEC for algal toxicity, the ratio is less than one and therefore it may be concluded that AAA has a low potential risk to the environment.

Acetoacetanilide is manufactured in closed systems. Based on the results of air monitoring of bagging and drumming areas, airborne concentrations in the workplace which are at or below 0.3 mg/m^3 would be expected to result in an EHE of 0.04 mg/kg. There is no direct consumer exposure to AAA because the substance is used as an

intermediate in other manufacturing processes. The EHE for indirect exposure is orders of magnitude lower.

Repeated oral exposure in rats to dose levels of > 30 mg/kg/day may result in methemoglobinemia. Daily doses of >100 mg/kg/day for 28 days result in reduced weight gains and feed consumption, possible cyanosis, methemoglobinemia, haemolytic anaemia, and extramedullary hematopoiesis in the spleen and liver. Animals allowed to recover for 14 days had hematologic parameters that were near normal with no evidence of anaemia or methemoglobinemia. The no-observable-effect level (NOEL) for 14 days of treatment was 102.4 mg/kg/day, but the NOEL for 28 days of treatment was 12 mg/kg/day with evidence that a dose level of 30 mg/kg for 6-8 weeks result in minimal methemoglobinemia (<5% MetHB) which is not clinically significant (NOAEL was 30 mg/kg/day). The NOEL for reproductive toxicity and developmental toxicity was 100 mg/kg. Mating and fertility were unaffected by treatment, and there were no microscopic lesions in the sex organs. There were no effects on gestation, implantation or viability, and no effects were observed in the pups.

Considering the effect on methemoglobinemia, the Estimated Dose of Low Concern (EDLC) is 0.3 mg/kg based on a NOAEL of 30 mg/kg from repeated dose studies and an Uncertainly Factor of 100. Based on the results of air monitoring of bagging and drumming areas, airborne concentrations in the workplace which are at or below 0.3 mg/m^3 would be expected to result in an EHE of 0.04 mg/kg. The EHE for indirect exposure is orders of magnitude lower. Using the occupational EHE, the ratio of EHE to the EDLC is less than 1, alternatively the margin of safety is 750, indicating that AAA is a chemical of low potential risk to man.

NATURE OF FURTHER WORK RECOMMENDED