

FINAL REPORT

ACRYLATES - STOICHIOMETRIC PROCESS
REMOVAL OF NICKEL CARBONYL
FROM AQUEOUS WASTES

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SUMMARY Nickel carbonyl can be removed or destroyed in aqueous solution by chlorination, thermal decomposition, or sparging with a gas stream. Selection of the best method for treatment of a particular aqueous stream depends upon materials present other than nickel carbonyl. Chlorination requires about 2 minutes to reach completion at 30°C. Thermal decomposition is essentially complete in about 20 minutes at 100°C and 20 psig. The decomposition rate is essentially the same at 130°C and 40 psig. About 45 volumes of gas per volume of solution is required in a sparging technique at 30°C.

The ammonia and slurry streams discharged from the ammonia desorber in the ammonia recovery system will contain a small quantity of nickel carbonyl. The slurry stream should be treated by a sparging technique to remove any nickel carbonyl present before the stream is discharged to the sewer.

These data will aid the Engineering Department in the design of waste disposal facilities and personnel safety features for the Acrylic Esters Unit.

INTRODUCTION At the request of the Engineering Department, a study has been made of methods for the removal or decomposition of nickel carbonyl in aqueous solution. One part of the study was concerned with nickel carbonyl in aqueous solution with or without the presence of organic material. A second part of the study investigated the fate of nickel carbonyl in the ammonia desorber in the ammonia recovery system of the acrylic esters process.

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