

A Study on Establishment of Designing and Screening Method
of Corrosion Resistant Paint and Lining for Sea Water

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Summary

Experiments were carried out to clarify the chemical degradation behavior of paint itself and its damage behavior under slurry erosion.

In this study, first of all, chemical degradation of paint were investigated.

The specimens used were bisphenol-A type epoxy resin paint and zinc-rich paint, and also partially exposed specimen were used.

Environmental liquids used were pure water, 5wt.% NaCl solution, HCl and NaOH solutions. After immersion in these solutions, the weight change of specimens were measured and degradation were evaluated by optical and scanning electron microscope, infrared spectoscopy and x-ray analysis.

Flowing results were obtained.

(1) The weight of specimen decreased by dissolution of uncrosslinked epoxy and hardener by immersion into these solutions. The epoxy resin showed an excellent resistance for chemical degradation in these solutions. If the coating resin is imperfect, however, the resistance decreases extremely and then the coating is peeled off easily.

(2) Zn in zinc-rich paint is dissolved under HCl and NaOH solution, then paint shows poor ability for protect the corrosion damage of metal. In NaCl solution, the metal is protected by zinc in the epoxy resin electrochemically and also by deposition of the reaction products to the imperfect part in partially exposed specimen.

(3) In the dissolution process, the zinc atom shows a step-like distribution in cross section of the specimen.