Al-brass의 해수부식에 관한 연구

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Corrosion Behavior of Al-Brass in Sea Water

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ABSTRACT

Corrosion behavior of aluminum-brass in synthetic sea water has been studied. An attempt has also been made to understand the effect of arsenic and nickel addition in the alloy upon the corrosion resistance. Corrosion performance of the alloys was compared. In addition accelerated corrosion test has been carried out $CuCl_2$ test solution.

It was found that corrosion rates of aluminum-brass in sea water were much lower than that of α-brass. Laboratory tests indicated that corrosion of aluminum-brass in sea water might be suppressed by a small additton of arsenic and nickel. In general, high test solution temperature increased corrosion rate under the condition of test. It was also observed that aluminum-brass was sufferd by localized dezincification in $CuCl_2$ test solution, on the other hand arsenic added sample showed smooth surface considered not to be dezincified. X-ray diffraction analysis indicated that dealloying process was taking place during the corrosion of alpha brass alloy.

황산 수용액 내에서 Pb-Ca 합금의 부식특성

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Corrosion behavior of Pb-Ca Alloy in Aqueous Sulfuric Acid Solution

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Abstract

Corrosion behavior of Pb-Ca alloy in 7.9N aqueous sulfuric acic solution has been studied using potentiodynamic polarizaiion technique. Pb-0.76% Ca mother alloy and eutectic Pb-0.08% Ca were prepared originally from chemical grade Pb-powder and metallic Ca in the specially designed melting apparatus. The casted mother alloy, in which uniformly distributed Pb_3Ca dendrites had been imbeded, showed remarkable increase in hardness compared with pure Pb ingot. The casted eutectic alloy aiso displayed much increase in hardness and the morphology of the two eutectic phases (primary alpha and Pb_3Ca) seemed to occur in lamellar form.

Cyclic linear sweep voltammogram for the above Pb-Ca alloys indicated that such Ca addition into Pb did not change much the shape of polarization curve for pure Pb. However, when the charging-discharging simulation of lead-acid battery positive by continuous cyclic linear potential sweep technique was performed on the above Pb-Ca electrode between the limited potential range 1600-1200mV vs SCE, the polarization behavior became complicated, and distinguishable with the number of cycles and the amount of Ca addition. The reason of this has been explained theoretically considering various Pb-compound electrode reactions and their equilibrium potentials. Cyclic corrosion product morphology was also examined and has been discussed briefly.