

국산 질석 첨가에 의한 Fe-Cr-Ni 강(ASTM A447)의 고온 방식 효과에 관한 연구

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The Reduction of High Temperature Corrosion for Fe-Cr-Ni Alloy
(ASTM A447) by the Addition of a Korean Vermiculite

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Abstract

The corrosion rates of Fe-Cr-Ni alloy (ASTM A447) in $V_2O_5-Na_2SO_4$ synthetic ash were measured in the range of 650-850°C with time and various ash compositions. For the reduction of corrosion rate of the alloy in the presence of fuel oil ash, a Korean vermiculite was used as an inhibition additive. The corrosion effects of the vermiculite were studied by using metallographic and X-ray methods. The inhibition effect might be obtained by the formation of a complex compound with synthetic ash. Considering corrosion prevention and economic view, the adequate amount of vermiculite addition to the ash was measured as 40%, and this amount might be applied to fuel oil comparing its ash content.

아연 단결정내에서의 수소확산 연구

김 인 배 문 인 형

A Study of Hydrogen Diffusion in Zinc Single Crystal

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Abstract

Electrochemical method was used for the study of hydrogen-diffusion in zinc single crystal. In the sample perpendicular to c axis, the diffusion coefficient of hydrogen at the temperature range of 25-71°C is as follows:

$$D=8.5 \times 10^{-2} \exp(-4,450/RT) \text{ cm}^2/\text{sec}.$$

In the sample parallel to c-axis, the diffusion coefficient was obtained that $D=3.5 \times 10^{-5} \text{ cm}^2/\text{sec}$ at room temperature. But this value is larger than that of the sample perpendicular to c axis. In other words, the diffusion coefficient perpendicular direction to c axis is larger than that of parallel direction to c axis. In the sample perpendicular to c axis, the diffusion coefficient was changed as the thickness of sample increasing. The larger value of diffusion coefficient for the zinc single crystal was obtained than that for the polycrystal. From this result it is concluded that, in the diffusion of hydrogen in zinc, grain boundary effects are negligible.