

碳钢钝化膜在碳酸盐溶液中的阴极还原机理

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摘要 本文采用动电位和恒电流技术研究了pH8.31-11.37的酸盐缓冲溶液中,低碳钢钝化膜的阴极还原机理。认为钝化膜的还原与溶液pH值密切相关,当 $8.31 \leq \text{pH} \leq 9.80$ 时, Fe_2O_3 还原为Fe用 FeOH^+ ;当9.80 关键词 [碳酸盐](#) [碳酸钠](#) [铁化合物](#) [还原反应](#) [低碳钢](#) [恒电位器](#) [碳酸氢钠](#) [钝化膜](#) [阴极效应](#)

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The cathodic reduction mechanism of passive film on mild steel in carbonate solution

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Abstract The cathodic reduction of passive films on mild steel was investigated by using the potentiodynamic and galvanostatic techniques in carbonate-bicarbonate buffer solns. at various pH values. The reduction strongly depends on the pH of the solns. At $8.31 \leq \text{pH} \leq 9.80$, ferric oxide was simultaneously reduced to Fe and FeOH^+ ; while at $9.80 \leq \text{pH} \leq 11.37$, ferric oxide was reduced to magnetite and $\text{Fe}(\text{CO}_3)_2^{2-}$. Both these reactions consisted of a no. of steps, and the rate-detg. step was the charge transfer reaction from FeOH_2^+ to $(\text{FeOH})_{\text{ads}}$.

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