

## 二次碱性锌电极的复合缓蚀剂

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**摘要:** 通过极化曲线和循环伏安曲线的测量, 对二次碱性锌电极中同时添加聚乙二醇 600 (PEG600) 和氢氧化铟 [In(OH)<sub>3</sub>] 作为复合缓蚀剂进行了研究。极化曲线的测试结果表明: PEG600 和 In(OH)<sub>3</sub> 具有明显的缓蚀协同作用, 这是由于 In(OH)<sub>3</sub> 还原生成的铟覆盖层加强了 PEG600 的吸附所致; 同时发现: 由于 PEG600 的吸附, 使得在开路电位附近氢的阴极还原和锌的阳极溶解都在一定程度上受到抑制, 但是一旦锌电极阳极极化到其脱附电位, PEG600 将从电极表面脱附, 并且不再阻碍锌的溶解。从循环伏安曲线推断出: 由于复合缓蚀剂的存在, 阳极钝化得以推迟, 枝晶生长和形变得以抑制; 同时也证实了多次循环后复合缓蚀剂可以保持其稳定作用。

**关键词:** 二次碱性锌电极; 复合缓蚀剂; 协同作用; 吸附

中图分类号: TM912.2

文献标识码: A

文章编号: 1001-1579(2004)02-0111-03

## Combined corrosion inhibitors for secondary alkaline zinc electrodes

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**Abstract:** The simultaneous addition of PEG600 and In(OH)<sub>3</sub> to secondary alkaline zinc electrode as combined corrosion inhibitors was examined by the measurements of polarization curves and cyclic voltammetry (CV) curves. The results of polarization curves showed that PEG600 and In(OH)<sub>3</sub> had an obvious synergistic effect on suppressing corrosion, which was attributed to the reinforcement of the adsorption of PEG600 by indium coating reduced from In(OH)<sub>3</sub>. It could be found that cathodic hydrogen evolution and anodic zinc dissolution could be hindered to some extent around the open-circuit potential as a result of the adsorption of PEG600, but PEG600 would be desorbed from the electrode surface and no longer hinder the dissolution of zinc once the zinc electrode was anodically polarized to its desorption potential. It could be deduced from the CV curves that, with the combined inhibitors, the delay of anodic passivation and the reduction of dendritic growth and shape change could be expected. The effectiveness of the combined inhibitors during cycles was also confirmed.

**Key words:** secondary alkaline zinc electrode; combined corrosion inhibitors; synergistic effect; adsorption