

可充镁电池有机电解液的研究进展

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摘要: 对有机格氏试剂盐系列电解质的研究进行了总结。镁的沉积过程是复杂的吸附过程。吸附物决定了沉积的形貌, 对循环效率有很大影响。Mg($AX_{4-n}R_n$)₂ 型有机镁盐(其中 A=Al, B, As, P, Sb, Ta 和 Fe 等, X=Cl, Br 和 F, R=烷基或芳基) 可以看作是 Lewis 碱 R_2Mg 和 Lewis 酸 $AX_{3-n}R'_n$ 的反应产物, 溶液中 Lewis 酸的浓度决定了电液的分解电位, R 基的含量决定可逆性的好坏, 以 THF/ $Bu_2Mg-(AlCl_2Et)_2$ 体系性能最佳。

关键词: 可充镁电池; 格氏试剂盐; 有机电解质

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The development of organic electrolyte for rechargeable magnesium battery

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Abstract: The development of organic electrolyte of magnesium battery was reviewed. Mg deposition-dissolution involved adsorption-desorption process. The specific adsorbed species affected the final morphology of Mg deposition, which strongly affected the cycling efficiency of Mg deposit. The grignard salts of Mg($AX_{4-n}R_n$)₂ type (A=Al, B, As, P, Sb, Ta and Fe; X= Cl, Br and F, and R=alkyl or aryl) could be expected to be products of a reaction between an R_2Mg Lewis base which played a key role of the decomposition potential of electrolyte and an $AX_{3-n}R'_n$ Lewis acid. The content of R groups was crucial for obtaining reversible magnesium deposition. The best performance was obtained with the solutions containing the THF/ $Bu_2Mg-(AlCl_2Et)_2$.

Key words: rechargeable magnesium batteries; ethereal solutions of grignard salts; organic electrolyte