第34卷 第1期 电 池 Vol.34, No.1
2004年 2月 BATTERY BIMONTHLY Feb., 2004

科研论文

# 非水电解液中 $LiPF_6$ 的光化学不稳定性

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摘要：使用尖晶石 $LiMn_2O_4$ 作为锂离子电池正极材料，采用恒电流充放电和粉末微电极的循环伏安方法对比研究了 $LiPF_6$ 的光化学不稳定性及其对电解液性能的影响。结果表明：在光催化作用下，$LiPF_6$ 分解产生的杂质在较低的电位条件下参与电极反应，诱发电解液组分的氧化分解，是破坏电解液性能的重要原因。在此基础上选择使用了一种能够吸附电解液中质子酸的沸石预处理剂，证实了在 $LiPF_6$ 电解液中质子酸含量的升高是影响电解液性能的重要因素。

关键词：锂离子电池； 尖晶石 $LiMn_2O_4$； $LiPF_6$； 有机电解液
中图分类号：TM912.9 文献标识码：A 文章编号：1001-1579(2004)01-0004-03



# Photochemical instability of $LiPF_6$ in non-aqueous electrolytes

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**Abstract**：Spinel $LiMn_2O_4$ was employed as positive electrode material for Li-ion batteries. Influences of photochemical instability of $LiPF_6$ solute on the electrolyte properties were examined by means of chronopotentiometry and cyclic voltammetry measurements. The results showed that $LiPF_6$ solute decomposed under the catalysis of light producing various kinds of impurities within the electrolyte system. Electrochemical reactions of the impurities occurred at relatively low electrode potentials inducing oxidation reaction of electrolyte components. These side reactions played a role of degrading electrolyte properties. Based on this idea, we selected a kind of zeolite as a pretreatment material，which was capable of absorbing trace proton acid presenting in the electrolyte. The increasing concentration of proton acid was confirmed to be an important factor affecting electrolyte properties.

**Key words**：Li-ion batteries； spinel $LiMn_2O_4$； $LiPF_6$； non-aqueous electrolytes