

氯离子与铟离子的总浓度比对铟锡氧化物前驱体(氢氧化物)粒径的影响

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摘要 用络盐法制备了铟锡氧化物(ITO)纳米粉末. 通过对铟和锡的络合盐 $[(\text{NH}_4)_2\text{InCl}_5 \cdot \text{H}_2\text{O}$ 和 $(\text{NH}_4)_2\text{SnCl}_6]$ 的制备研究, 证实了反应初始溶液中络离子的存在.

通过调节氯离子与铟离子的总浓度比研究了络离子对ITO前驱体(氢氧化物)粒径的影响.

提出了络离子对纳米ITO粉末粒径的影响原理: 络离子的存在, 降低了反应初始溶液中游离 In^{3+} 和 Sn^{4+} 的浓度, 有利于纳米级ITO粉末的生成. 通过XRD和激光粒度仪对ITO前驱体(氢氧化物)进行了表征.

关键词 [铟锡氧化物\(ITO\)](#) [络盐法](#) [原理](#) [前驱体](#)

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Influence of the Total Concentration Ratio of Chlorine Ion and Indium Ion on the Particle Sizes of Indium Tin Oxide Precursor (Hydroxide)

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Abstract The complex salt method, a method of preparing indium tin oxide (ITO) nanopowders was put forward. The complex salt crystals, $[(\text{NH}_4)_2\text{InCl}_5 \cdot \text{H}_2\text{O}$ and $(\text{NH}_4)_2\text{SnCl}_6]$ were synthesized, which proved the formation of complex ions in the reaction solution. The influence of complex ions on the particle sizes of ITO precursor was researched by increasing the total concentration ratio of chlorine and indium ions $T_{\text{Cl}}/T_{\text{In}}$. The influence mechanism of complex ions on the particle sizes of ITO powders was first disclosed and put forward. The exist of complex ions decreased the concentration of dissociative In^{3+} and Sn^{4+} and increased the controllability of ITO particle sizes, which was favorable to the preparation of ITO nanopowders. ITO precursors were characterized by XRD and a laser particle size analyzer.

Key words [indium tin oxide \(ITO\)](#) [complex salt method](#) [mechanism](#) [precursor](#)

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