



## 论文摘要

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### 聚丙烯酰胺对锑掺杂二氧化锡前驱体的后处理

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**摘要:** 以 $\text{SnCl}_4 \cdot 5\text{H}_2\text{O}$ ,  $\text{SbCl}_3$ 和  $(\text{NH}_4)_2\text{CO}_3$ 为基本原料, 采用湿化学法制备锑掺杂二氧化锡纳米粉体。研究絮凝剂聚丙烯酰胺(PAM)对锑掺杂二氧化锡(ATO)前驱体的固液相分离过滤速度和产物ATO粒径的影响及其相互作用机理。借助透射电镜(TEM)、热重-差示扫描量热分析(TG-DSC)等进行表征。研究表明: 采用适量PAM对纳米ATO前驱体进行絮凝处理, 不但能显著提高纳米ATO前驱体的固液相分离速度, 缩短分离过滤时间, 且能有效地抑制硬团聚的形成; 采用非离子聚丙烯酰胺对纳米ATO前驱体进行絮凝处理, 分离过滤时间仅为原来的1/10, 所得产物平均粒径小于10 nm。

**关键字:** 锑掺杂二氧化锡(ATO); 聚丙烯酰胺(PAM); 硬团聚; 分离速度

### Post treatment of precursor of antimony-doped tin dioxide with polyacrylamide

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**Abstract:** A novel post treatment process with macromolecular polyacrylamide (PAM), which was widely applied to water treatment, was presented. Antimony-doped tin dioxide (ATO) nanometer powders were prepared by wet chemical co-precipitation method using tin tetrachloride ( $\text{SnCl}_4$ ), trichloride antimony ( $\text{SbCl}_3$ ) and ammonium carbonate ( $(\text{NH}_4)_2\text{CO}_3$ ) as raw materials. Interaction mechanisms and influences of PAM on the filtration time of nano-ATO precursor and particle size of ATO were studied using transmission electron microscopy (TEM), thermogravimetric- differential scanning calorimetric instrument (TG-DSC), Fourier transform infrared spectroscopy (FT-IR) and laser particle size apparatus. The results show that PAM is a highly effective additive for the preparation of ATO nanometer material, which not only speeds up the detachment speed between the phases of solid and liquid, but also effectively prevents the formation of hard aggregation of ATO. The average particle size of ATO nanometer prepared using nonionic PAM as filtration aid and disperser is smaller than 10 nm, and the filtration time is shortened to 1/10.

**Key words:** antimony-doped tin dioxide (ATO); macromolecular polyacrylamide (PAM); hard aggregation; detachment speed

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