

Sb掺杂SnO₂(ATO)纳米晶的水热合成和导电性能

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摘要 以Sn和SbI₃为主要原料,在120-170 ℃温和水热条件下合成了具有导电能力的Sb掺杂SnO₂(ATO)透明导电纳米粉体,运用FT-IR, XRD, BET, TEM等手段对

粉体的形成过程进行了分析表征。实验结果表明,所合成的纳米ATO粉体均为四方锡石结构,无其他杂相存在,晶粒大小在4-7nm之间,粉体呈单分散状态。比表面积在137-184m²·g⁻¹之间,随水热温度的升高,晶粒长大,比表面积下降,粉

体导电性能提高。该方法对于其他透明导电氧化物纳米粉体的合成具有借鉴意义。

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Hydrothermal Synthesis of Antimony-doped TinOxide (ATO) Nanoparticles and Electrical Property

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Abstract Antimony-doped tin oxide (ATO) nanoparticles were synthesized by the hydrothermal method from the starting materials granulated tin and SbI₃, the hydrothermal reaction took place at 120 ~ 170 ℃ for 20 h. The crystallizing process and the particles were characterized by means of FT-IR, XRD, BET and TEM. XRD shows that all the diffraction patterns agree well with the bulk SnO₂ cassiterite structure. The crystallite sizes of the ATO particles were about 4~7 nm. The specific surface areas were about 137 ~ 182 m²·g⁻¹. With the increase of hydrothermal temperature the crystallite size increased, the specific surface area decreased and the conductivity increased. TEM shows that the nanoparticles are monodispersed. This method can be used to synthesize other transparent conductive oxides.

Key words [TIN OXIDE](#) [DOPE](#) [HYDRO-THERMAL REACTION](#) [NANOPHASE MATERIALS](#) [ELECTRICAL CONDUCTIVITY](#) [FT IR](#) [XRD](#) [TEM](#) [GRAIN](#)

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