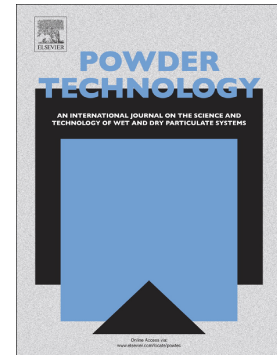


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## Preparation and electrical properties of wollastonite coated with antimony-doped tin oxide nanoparticles

Caili Wang<sup>\*</sup>, Dong Wang, Runquan Yang, Huaifa Wang<sup>\*</sup>

*College of Mining Technology, Taiyuan University of Technology, Taiyuan, 030024, P.R.China*

**Abstract:** Composite antistatic powders of wollastonite coated with antimony-doped tin oxide nanoparticles (Sb-SnO<sub>2</sub>/wollastonite, SSW) were prepared by heterogeneous nucleation method. The samples were characterized by X-ray diffraction (XRD), Fourier transform infrared (FTIR) spectroscopy, Scanning electronic microscopy (SEM), Transmission electron microscopy (TEM) and Energy-dispersive X-ray spectrometry (EDS). Effects of pH value, hydrolysis temperature, coating amount, SbCl<sub>3</sub> to SnCl<sub>4</sub>·5H<sub>2</sub>O molar ratio, calcination temperature and time on the resistivity of SSW powders were studied. It was shown that after coated with Sb-SnO<sub>2</sub> particles, the whiteness of wollastonite has been decreased from 91.7 to 90.5, the specific surface area has been increased from 1.41 to 3.65 m<sup>2</sup>/g, the volume resistivity has been reduced from  $3.36 \times 10^{10} \Omega \cdot \text{cm}$  to  $0.85 \times 10^5 \Omega \cdot \text{cm}$ . The fibriform wollastonite particles were coated with a layer of 30-50 nm thickness of well crystallized and uniform antimony-doped tin oxide (Sb-SnO<sub>2</sub>). A possible mechanism for coating of Sb-SnO<sub>2</sub> nanoparticles on the surface of wollastonite fiber was proposed.

**Keywords:** Wollastonite; Antimony-doped tin oxide; Composite materials; Electrical properties; Heterogeneous nucleation method

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<sup>\*</sup> Corresponding author: Tel: +86 18835102943(Caili Wang) ; +86 13935123169(Huaifa Wang)  
E-mail addresses: 229478584@qq.com(Caili Wang); tyut01@163.com(Huaifa Wang)

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