

**Recycling approaches of waste cathode ray-tube in China**

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Cathode ray-tube (CRT) is an important device mainly used as video display component in television and computer. It is rapidly replaced by advanced displays such as liquid crystal display and plasma display, resulting in a huge number of waste CRTs. CRT funnel glass generally contains high level of PbO, which is classified as hazardous waste. This type of waste may contaminate our living environment due to improper treatment. In the present study, a novel process for lead nanopowder synthesis from this type of glass was developed by combining vacuum carbon-thermal reduction and inert-gas consolidation procedures. The key merit of the process was to evaporate lead out of the glass to obtain harmless glass powder and synchronously produce lead nanoparticles. In the synthesis process, lead oxide in the funnel glass was firstly reduced to elemental lead, and evaporated rapidly in vacuum circumstance, then quenched and formed nano-size particles on the surface of the cooling device. Experimental results showed that temperature, pressure and argon gas flow rate were the major parameters controlling lead evaporation ratio and the morphology of lead nanoparticles. Toxicity characteristic leaching procedure results showed that lead leaching from the residue glass met the USEPA threshold. Accordingly, this study developed a practical and environmental-friendly process for detoxification and reclamation of waste lead-containing glass.

**Biography**

Fu-Shen Zhang, PhD, is Professor and Director of Solid Waste Recycling Department at Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences. He got his PhD in the field of Environmental Engineering from Tohoku University (Japan), and carried out Post-doctoral researches at the University of Michigan (USA) and Nagoya University (Japan). His recent researches address effective recycling of solid wastes, including valuable matters recovery and functional materials development from electronic waste, construction waste, municipal solid waste and bio-waste. He has published more than 100 peer reviewed articles and applied for more than 30 patents.

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