

5<sup>th</sup> World Congress on

# Materials Science & Engineering

June 13-15, 2016 Alicante, Spain

## Preparation of polyamide microspheres with tunable morphology and size for use in SLS processing

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Materials technology is currently a great challenge in selective laser sintering (SLS). Because of the lack of new types of material and the high cost of the present polyamide 12 (PA12) powder, the development of new method for the preparation of a variety of materials has drawn great attention from both industrial and academic organizations. In this work, we developed a simple strategy to prepare polyamide 12 (PA12) microspheres through a modified phase-separation process. The phase separation was conducted by adding ethanol as a poor solvent into a formic acid solution of PA12 pellets with polyvinyl pyrrolidone as a dispersant. The mean diameters of the obtained PA12 microspheres, ranging from tens to hundreds of micrometers, were well controlled by adjusting the amount of ethanol and the phase separation temperature. Further investigation by differential scanning calorimetry demonstrated that the sintering window for PA12, between the onset temperatures of crystallization and melting, was drastically stretched during the microsphere formation process. Encouragingly, this microsphere preparation method has demonstrated some extent of universality for the preparation of other polymer powders. Microspheres of PA 6 and polystyrene can also be prepared using the same strategy when the solvent systems was changed to be acetic acid/ethanol and chloroform/ ethanol, respectively. Therefore, this approach provided an effective method to prepare a large amount of polymer powder and showed significant advantages for commercialization.

### Biography

Gexia Wang has completed her PhD from Technical Institute of Physics and Chemistry (TIPC), The Chinese Academy of Sciences (CAS) in January 2012. She is now Assistant Research Fellow of National Engineering Research Center of Engineering Plastics in TIPC. She is chiefly engaged in the research on engineering plastics, particularly on polymer powder used in Selective Laser Sintering. She has published more than 9 papers in reputed journals.

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