

Fabrication of Multi-layer Agglomerates in Taylor Vortex

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The fabrication of multi-layer agglomerates has been accomplished by the development of unique fluid hydrodynamic Taylor vortex flow. The dense multi-layer agglomerates consisted of two parts as inner and outer layer that were carefully characterized by field emission scanning electron microscopy (FE-SEM), transmission electron microscopy energy-dispersive spectroscopy (TEM-EDS), X-Ray diffraction (XRD), zeta-potential and tap-density. The experimental results revealed that the multi-layer agglomerates has unique morphology of inner and outer layer, completely coverage of outer on the inner surface. It should be mentioned that the outer layer formation and thickness were relatively effected on the properties of multi-layer crystals. Herein, the outer thickness varied from nanometer to micrometer and uniformity of the multi-layer crystals was found to strongly depend on crystallization conditions such as the outer feed concentration, fluid hydrodynamic condition, mean residence time, etc. Therefore, the multi-layer agglomerates is a significant breakthrough in material design.