

Agglomeration of Metal Hydroxide Crystals in Continuous Reaction Crystallization

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In the present study, the spherical agglomerates of metal hydroxide crystals were investigated in continuous reaction crystallization. Metal oxide is known as a battery material of low cost and high capacity, where the powder characteristic of agglomerates such as shape, size and size distribution are important in determining the electric properties of electrode. Since the agglomeration of crystals consisted of the crystal collision, adhesion and molecular growth, the crystallization conditions such as agitation speed, supersaturation and mean residence time, etc were considered as the controlling parameters for the spherical agglomeration of the crystals with uniform size distribution. In the previous studies, the batch operation with a long crystallization time over 12 hrs was frequently adopted for the spherical agglomerates. However, at our optimized conditions of the continuous crystallization, the spherical agglomerates of metal hydroxide less than 5 μ m of uniform size (C.V. less than 20%) were obtained. Also, the spherical agglomerates showed the high tap density over 2.0 g/cm³. Therefore, it was concluded that the continuous reaction crystallization was more effective and productive in controlling the agglomerate shape, size and size distribution than the batch crystallization.