

Precipitation of Barium Sulfate Nanoparticles in Continuous Conical Couette-Taylor Crystallizer

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A continuous Couette-Taylor (CT) crystallizer exploiting the conical inner cylinder was developed to produce the barium sulfate nanoparticles by reaction precipitation. According to the experimental results, the barium sulfate nanoparticles of less than 600 nm were achieved and significantly depended on the specific conical inner cylinder of CT crystallizer. The influence of the conical inner cylinder on the nanoparticles size was explained in terms of the different mass transfer processes at the solid-liquid interface along with axial direction of CT crystallizer. In the precipitation of barium sulfate, the apex angle of inner cylinder, rotation speed, ratio of feed solution and mean residence time would be considered as the influencing factors for determination of the barium sulfate nanoparticle size.