

Analyzing the degree of mixing between incline and straight wall fluidized bed through image analysis

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Abstrak

Fluidized bed is used for many purposes in the industry such as for reactor, drying or mixing. In the pharmaceutical manufacture, drying in fluidized bed is an essential manufacturing step because during the drying process the resulting moisture content should be uniform. It was often founded that batch of the pharmaceutical products has a wide range of moisture content which therefore leads to a termination of the whole batch of product. To avoid different moisture content a better mixing inside the fluidized bed was then required. The effect of bed height, particle placement and geometry of fluidized bed was then analyzed. In this experiment a mixing of two different particle size are mixed inside an adjustable wall fluidized bed. With one of the particles are colored so the mixing could be seen visually from the sides of the perplex glass. The mixing was then observed at two different flow rates which is the bubbling and twice the bubbling flow rate. The variable that will be manipulated will be the bed height, particle size and wall angle. It was then founded the higher the bed height the better the mixing will be this was shown in the result of increasing of mixing area for the 2 cm 13,8% , the 4 cm 38% and the 10 cm is 66,7%. The effect of particle placement shows that when the larger particle are placed on the bottom the mixing will increase particle placement when it is place on the bottom the mixing area is 44,2% and when it's place on the top the mixing area is just 29,1%. The effect of geometry wall was analyzed the result shows that the incline wall created better mixing for the 4 cm the mixing area is 44,2 % for straight wall and 58,2% for the angle wall although future work is still needed to strongly support the result due to possible equipment error.