A ROTATING FLUIDIZED BED IN A STATIC GEOMETRY: EXPERIMENTAL PROOF OF CONCEPT

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ABSTRACT

The new concept of a rotating fluidized bed in a static geometry is presented [1]. The rotating motion of the fluidized bed is obtained by the tangential injection of the fluidization gas via multiple gas inlets. The solids experience a radially outwards centrifugal force. The gas, on the other hand, is forced to move radially inwards towards a chimney with one or more outlet slots, fluidizing the solids. The new concept was experimentally proven using a 36 cm diameter, 13.5 cm long, fluidization chamber with 12 tangential gas inlet slots and a central chimney with a single outlet slot. The fluidization behavior with both large-diameter, low-density, polymer particles and small-diameter, higher-density, alumina particles has been investigated. Furthermore, the fluidized bed has been operated under dilute and dense conditions and in the vertical and horizontal position. In all cases, at sufficiently high rotational speeds, a rotating fluidized bed and good gas-solids separation could be obtained.

REFERENCES

[1] Axel de Broqueville : Catalytic polymerization process in a vertical rotating fluidized bed : Belgian Patent 2004/0186, Internat. Classif. : B01J C08F B01F; publication number : 1015976A3