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INFLUENCE OF FACTIOUS COMPOSITION OF FRIABLE MATERIAL ON PROCESS OF ITS GRANULATION

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The results of researches on influence of factious composition for friable material and type of granulating aggregate on efficiency of process of granulation are expounded. Description over of mechanism of initiation and increase of granules at different initial grain-size distribution friable materials is brought.

Keywords: sintering mixture, fractious composition palletizing, drum granulator, disk-shaped granulator

The basic element of preparation of sintering mixture and pellets to thermal treatment is by palletizing, the role of which rises as far as the use of iron-ore concentrates of the deep enrichment in the conditions of instability of factious composition of material, given in a granulator.

On flowing of process of pelletizing of friable material substantial influence renders correlation of speeds of moving to its fraction which is balled and fraction which is by balled in the cross-section of granulator. Speed of movement of all fractions of friable material in ascending stream practically identical. Therefore pelletizing does not take place practically. At rolling of particles of friable material there is his pseudo fluidizing and division of stream on separate fractions depending on their physics and mechanical descriptions. The considerable degree of loosening of friable material does not allow to accept this stream continuous and its it is necessary to examine as an totality of separate particles which are freely enough rolled.

If fraction part of material which is balled consists mainly of fractions of large sizes, which can be characterized by the subzero value of coefficient of friction, then the optimal conditions of pelletizing will be attained at the relatively small corners of getting up of mass of friable material in a granulator.

As far as the increase of content of shallow fraction in part which is balled friable material the optimal value of corner of getting up of its mass will increase.

Formation of center for pelletizing takes place in the place of falling of drops of moistening liquid in mass of friable material. Under the action of forces of surface-tension shallow fractions are tightened to the center of appearing aggregation, creating a body, near in a due form to spherical. At further motion on granulator the structure of aggregation is made more compact, that assists squeezing out of liquid on its surface and joining of new fractions which is by balled.

In the process of pelletizing of polydisperse friable material formation of new particles of standard size takes place due to breaking of shallow fraction over large fraction, being centers of pelletizing granules. As a result friable material possessing by enough high mechanical descriptions appears.

Whereas that in the process of getting up of pelletizing mass there is a division of rising friable material on fractions, it is necessary to provide joint motion of fraction which is balled and fraction which is by balled on the area of rolling.

Thus, as an analysis of conditions of co-operation of different fractions of friable material shows in the process of its granulation, the type selection of granulating aggregation is determined by many factors from which as basic it is possible to distinguish grain-size of acting material and technological requirements to quality of its pelletizing.

Results of research of conditions of motion of friable material show that in granulating aggregations [13], drum granulators provide effective pelletizinge of polydisperse grain-size distribution require the increase of rate of movement of the rotary driven surface of aggregate. In drum granulators it results to worsening of co-operation fractions of friable material which is by balled and fractions of friable material which is balled and to the decline of speed of pelletizing. Therefore, the lateral surface of aggregate it is expedient to use only for transporting of friable material, and the process of pelletizing directly to carry out on a inclined butt-end surface. These conditions are executed in disk-shaped granulators which are presently used for pelletizing of microdisperse friable materials.

Drum granulating are characterized by high stability of work with polydisperse material, but the pellitizing material got in them has heterogeneous grain-size. Therefore, the use of drum granulators without additional devices is effective only in a sintering production. In spite of the fact that disk-shaped granulators is characterized by subzero stability on the productivity, they provide the receipt of homogeneous on grain-size friable material from microdisperse iron-ore raw material. It stipulates expediency of their application at the production of pellets. Coming from the features of motion of friable materials in granulators of different types it is necessary to mark, that for disk-shaped aggregates is needed more high-quality preparation of friable material (their averaging and dosage in granulator).