HI P 4 text rada / full text

Ispitivanje dinamike granulacije praškastih materijala u fluidizovanom sloju

Tatjana Kaluđerović Radoičić, Mihal Đuriš*, Drako Jaćimovski*, Zorana Arsenijević*
Tehnološko-metalurški fakultet, Univerzitet u Beogradu, Beograd, Srbija
**Institut za hemiju tehnologiju i metalurgiju - nacionalni institut, Univerzitet u Beogradu, Beograd, Srbija*

U ovom radu izvršeno je eksperimentalno ispitivanje procesa mokre granulacije u fluidizovanom sloju u cilju pronalaženja optimalnih uslova izvođenja procesa i sastava veziva kojim će se ostvariti željena dinamika razvoja granula. Ispitivanje je izvršeno u šaržnom sistemu, a korišćeno je kukuruzno brašno kao polazni materijal. Izvršeno je 10 eksperimenata u kojima je kao vezivno sredstvo korišćen rastvor saharoze različitih koncentracija: 20, 30, 35 i 40 %. Temperatura je održavana konstantnom tokom procesa granulacije i iznosila je 40-50°C. Uzorci su iz sloja uzimani u jednakim vremenskim intervalima od 3 min. Dinamika granulacije ispitivana je određivanjem tri različita faktora (nasipne gustina, vlažnosti i raspodele veličine čestica) za svaki od uzoraka. Utvrđeno je da nasipna gustina kontinualno opada tokom izvođenja procesa granulacije, dok u fazi sušenja ostaje konstantna. Raspodela veličina čestica je pokazala da srednji prečnik projektovane površine ravnomerno raste tokom procesa. Poređenjem sva tri ispitivana faktora pokazano je da se najbolji kvalitet granula postiže korišćenjem 35 % rastvora saharoze kao vezivnog sredstva.

Investigation of the dynamics of fluidized bed granulation process

Tatjana Kaluđerović Radoičić, Mihal Đuriš*, Drako Jaćimovski*, Zorana Arsenijević*
Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia
**IChTM- Department for Catalysis and Chemical Engineering, University of Belgrade, Belgrade, Serbia*

In this paper, experimental investigation of the dynamics of the process of fluidized bed granulation was performed, in order to find optimal process conditions and binder concentration to achieve the desired granules development. The experiments were performed in batch system using corn flour as starting material. Ten experiments were performed in which sucrose solution of different concentrations (20, 30, 35 and 40 %) was used as binder. The temperature of the system was kept constant during the granulation process and amounted to 40-50°C. Samples were taken from the fluidized bed at time intervals of 3 min. The dynamics of granulation was examined by determining three different factors (bulk density, moisure content and particle size distribution) for each of the samples. It has been found that bulk density continuously decreases during the granulation process, while in the drying phase it remains constant. Particle size distribution has shown that the average diameter of the projected surface increases uniformly during the process. By comparing all of the three investigated factors, it was shown that the best quality of granules is achieved using 35 % sucrose solution .