عنوان مقاله:

Modeling and Optimizing Aluminum Hydroxide Precipitation Process in Industrial Scale; case study: Iran Alumina Plant

محل انتشار:

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نویسندگان:

H. A. Mirzaei - *School of Mining Engineering, College of Engineering, University of Tehran, Tehran, Iran*

M. Noaparast - *School of Mining Engineering, College of Engineering, University of Tehran, Tehran, Iran*

H. Abdollahi - *School of Mining Engineering, College of Engineering, University of Tehran, Tehran, Iran*

خلاصه مقاله:

The precipitation of aluminum hydroxide from a supersaturated sodium aluminate solution is known as an essential production step in the Bayer process. In this work, the real precipitation process in the Iran Alumina Plant was modeled by the historical data with the help of Design Expert. According to the results obtained, the recovery is significantly improved with decrease in the super-saturation factor (α) of the solution. However, this modification was found to be the most difficult change due to the operational problems. The results obtained indicated the significant impact of the seed size on the product size. The negligible effects of the other parameters involved on controlling the amount of fine grains (< ۴۴ μm) and coarse grains (> ۱۵۰ μm) in the product showed the significance of reactivating the classification and agglomeration sections. Ultimately, it was found that the recovery process could be enhanced from ۴۶.۳۲% to ۴۷.۸۶% at a constant α by increasing the seed concentration to ۴۰۰ g/L, increasing the retention time by adding two precipitation tanks and reducing the temperature of the last precipitation tank by ۲ ºC (by reducing the .temperature of the inlet suspension), while preserving the quality of the product

کلمات کلیدی:

Aluminum hydroxide precipitation, Nucleation, Growth, Agglomeration, Supersaturation