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Reactivity Study on South African Calcium Based Material Using a pH-Stat and Citric Acid: A Statistical Approach

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Abstract : The study on reactivity of calcined calcium-based material is very important in dry flue gas desulphurisation (FGD) process, so as to produce absorbent with high sulphur dioxide capture capacity during the hydration process. The effect of calcining temperature and time on the reactivity of calcined limestone material were investigated. In this study, the reactivity was measured using a pH stat apparatus and also confirming the result by performing citric acid reactivity test. The reactivity was calculated using the shrinking core model. Based on the experiments, a mathematical model is developed to correlate the effect of time and temperature to the reactivity of absorbent. The calcination process variables were temperature (700 -1000°C) and time (1-6 hrs). It was found that reactivity increases with an increase in time and temperature.

Keywords : reactivity, citric acid, calcination, time
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