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Study on Hydration of Raw Material for Preparation Silica-steel MgO Precursor

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Abstract: By spray pyrolysis method bischofite in Qinghai salt Lake as primary raw material, was used to prepare precursor raw material MgO for silicon-steel MgO. The precursor raw material MgO was used for preparing $Mg(OH)_2$ which was the precursor of silicon-steel MgO by hydration method. In the hydration experiment of precursor raw material MgO, some experiment parameters were investigated systematically, such as the hydrated agent, the temperature and time of hydration, liquid/solid ratio that affected the hydration rate, rate of filtration and purity. The theoretical optimum conditions were obtained by uniform experimental design, DPS data processing, model analysis, quadratic polynomial regression model to establish the mathematical model, variance analysis of factors and the total variance analysis, and then, the theoretical optimum conditions were verified by repeated trials: hydration temperature 60°C , hydration time 105 min, liquid/solid ratio 4, ageing time 4 h, hydrated agent I 4.0%, hydrated agent II 3.15%, washing water 4, Stirring speed 120 r/min. Under the conditions mentioned above, the hydration rate of raw MgO reached over 99.50% and the precursor $Mg(OH)_2$ for silica-steel MgO has such advantages that high purity and good filtration performance.

Key words: Uniform experiment; Quadratic polynomial regression; DPS; Silicon-steel magnesium oxide; Hydration

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