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CONVERSION OF COAL FLY ASH TO A FRAMEWORK ALUMINOSILICATE UTILIZING ALKALINE HYDROTHERMAL SYNTHETIC METHODOLOGY

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ABSTRACT

The amount of coal fly ash generated by coal-based thermal power plants has been increasing at an alarming rate throughout the world. Low amount of beneficial nutrients, low cation exchange capacity, high alkalinity are some of the factors responsible for its limited utility. In addition disposal of such a huge quantity of fly ash requires about 50,000 acre of a land with an annual expenditure of about Rs500 million for transportation. Several approaches have been made for proper utilization of fly ash, either to reduce the cost of disposal or to minimize the environmental impact. One of the approaches is the conversion of fly ash into zeolites, which have wide applications in ion exchange, as molecular sieves, catalysts and adsorbents. So the present study is aimed at the synthesis of zeolite from coal fly ash using hydrothermal synthetic methodology. The mechanism of zeolite crystallization and role of alkali solution the synthesis reaction is also discussed.

KEYWORDS: fly Ash, zeolite, hydroxysodalite, hydrothermal synthesis, reaction mechanism