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A thesis submitted in partial fulfillment

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ABSTRACT

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The solid waste resulted from aluminum sulfate manufacturing can be used as a source of silicate. This waste is called partially de-aluminated metakaolin (PDMK). This work aims at utilizing such waste in synthesis of some zeolites. Cancrinite and Chabazite are two members of zeolites family were synthesized from partially de-aluminated metakaolin. Alumina ratio was adjusted by adding aluminum sulfate. Cancrinite was synthesized by heating and dissolving of PDMK in solution of 4 N soudium hydroxide at 130°C then cooled and filtered . A solution of aluminum sulfate was added to the filtrate, an autoclave for 6 hours at 130 °C and at a pressure of 2.5 atm., then cancrinite was obtained. Chabazite was synthesized by heating and dissolving of PDMK in solution of 4N soudium hydroxide at 130 °C then a solution of aluminum sulfate was added ,an autoclaved for 6 hours at 130°C and at a pressure of 2.5 atm. then chabazite was obtained. Cancrinite and Chabazite were characterized using XRD and SEM. Chabazite was used in removal ammonia from synthetic ammonia solution, the removal percentage reach 81 % at room temperature, pH 7, particle size 0.2 mm and contact time 30 min. The experimental results indicated that Chabazite is a promising materials for the removal of ammonia from water.

Key words : kaolin, Cancrinite , Chabazite, partially de-aluminated kaolin, soudium hydroxide, XRD, SEM, aluminum sulfate , silica, alumina.

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