

## Potential Contribution of Low Cost Materials in Clean Technology

Heman A. Smail<sup>a</sup>, Kafia M.Shareef<sup>a</sup>, Zainab Ramli<sup>b</sup>

<sup>a</sup>Department of Chemistry, College of Science, university of Salahaddine-  
Erbil, Erbil, Iraq

<sup>b</sup>Department of Chemistry, College of Science, Universiti Teknologi  
Malaysia

### Abstract

As the world's population approaches 9 billion, the strain on the planet's resources is steadily increasing. This demand can only be met by improving production methods to reduce the use of chemicals and the amount of chemical waste. Zeolites are among the least-known products for environmental pollution control, separation science and technology. This study investigates whether the use of geological sources as low-cost materials are suitable for zeolite synthesis and future applications. In this investigation natural montmorillonite clay, locally available in Erbil- Kurdistan, was used as raw material. The experiments were carried out in the presence of ultrasound 30KHz at 60 °C and for different crystallization times (5 ,10 &15 hours) and the results were compared with those obtained by performing conventional alkaline hydrothermal static syntheses under similar conditions and crystallization time of ( 90 hours). The raw material as well as the products were analysed using; Fourier Transform Infra-Red (FT-IR), X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF) spectroscopy. The experimental data were ascertained the formation of Zeolite successfully. Crystallization by ultrasound has been demonstrated to offer the possibilities of increasing the nucleation and crystallization rates of zeolites, improving the yield and directing the synthesis towards different crystal phases.

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