

HYDROTHERMAL SYNTHESIS OF ZEOLITE KZ-2

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Abstract :

Zeolite KZ-2 is grown synthetically in the laboratory using hydrothermal method. Samples with different Si/Al ratios have been prepared and characterized. Progressive crystallization of zeolite KZ-2 has been studied.

Keywords : Synthetic Zeolite, KZ - 2, Hydrothermal method

1. Introduction

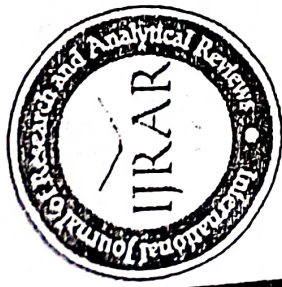
There are two major reasons for studying the synthesis of zeolite crystals. The first is the need to understand reactions occurring in the lithosphere on or near the surface or in abyssal rock. These reactions are occurring in open system and may be as vast in scale as in the range of variables such as pressure, temperature and time. The second reason is technical, a search for cheaper or better replacement for natural zeolites and production of synthetics of better quality having specific built-in properties.

From last several decades chemists, mineralogists, geologists and crystallographers have been extremely interested in reproducing the formation of minerals in the laboratory by methods which were believed to simulate natural processes. Early investigators were interested in the interpretation of conditions for crystal formation since they are related to geological processes.

The first industrial research efforts by Milton and his associates at Union Carbide Corporation in 1948 resulted in the synthesis and manufacture of synthetic zeolites which had never existed as crystal. The controlled synthesis was a key research achievement (1). The synthetic zeolites are better suited for research and industrial applications because of their purity and greater uniformity in composition. This is particularly essential when a high degree of reproducibility is required in an industry.

2. Earlier work on Hydrothermal Growth of Zeolites

Attempts to synthesize silicates under hydrothermal conditions began with Schafhautele, who reported the preparation of quartz by heating a "gel" silica with water in an autoclave. St. Claire Deville reported the synthesis of "levynite" by heating aqueous solutions of potassium silicate and sodium aluminate in glass tube at 643 K. The work published upto 1937 has been reviewed extensively by Morey and Ingerson (2).



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