

## **SYNTHESIS AND CHARACTERIZATION OF CALCIUM ALUMINUM SILICATE HYDROXIDE (CASH) CRYSTALS**

B. V. Suresh Kumar\*, S. Vasuki, B. Basavalingu and K. Byrappa

*Department of Studies in Earth Science*

*University of Mysore, Manasagangotri, Mysore.*

*\*E-mail: bvsureshkumar@yahoo.com*

### **Abstract**

Minerals whose compositions fall within the  $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}$  (CASH) system are found in a wide variety of metamorphic and igneous rock. Many experimental investigations have been conducted on reaction with the CASH system, but there are many more yet to be studied. Hence phase relations in the CASH system are of great importance in experimental mineralogy. Attempts have been made to synthesize the crystals belonging to these groups (anorthite, zoisite in particular) under hydrothermal treatment of a co-precipitated gel of zoisite [ $\text{Ca}_2\text{Al}_3\text{Si}_3\text{O}_{12}(\text{OH})$ ], composition at low to medium temperatures (400-600°C) and ambient pressures (1 to 1.5 kb) in the duration of 24 to 136 hours.

The obtained run products were identified as Anorthite with minor Quartz, Kyanite and Aluminum oxides phases by X-ray diffraction patterns. The changes in the structural environment can be detected through changes in the energies of OH-vibrations, strong wagging mode of Si-H bond, the stretching mode of Si-C bond, Si-O-Si stretching mode of cyclic trimer, O-H deformation mode, C-O asymmetric stretching and O-H molecule stretching are measured by infrared spectroscopy. SEM shows the growth direction and texture of discrete crystals of anorthite. The chemical composition was obtained by the EDAX.

**Keywords:** Anorthite, X-ray diffraction, FTIR, EDAX.