18. Dielectric properties of Ion Exchanged Fly ash based Zeolite

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ABSTRACT:

In India coal fly ash is generated on a large scale by thermal power stations. This hazardous, solid waste material can be used as a source material for synthesizing novel materials like zeolites. The solid waste material fly ash was used to synthesize zeolite NaP1 with general formula $|Na_{5.92}(H_2O)_{11.28}|[Si_{9.92}Al_{6.08}O_{32}]$ using microwave treatment by hydrothermal method with NaOH. The zeolite NaP1 is a low siliceous zeolite. The material was properly ion exchanged so as to obtain Cu- NaP1 form. All compositions show cubic structure with space group I-4. The samples were characterized by variety of physical techniques X-ray diffraction (XRD), IR and scanning electron microscope (SEM) techniques. The dielectric parameters like dielectric constant (ε'), dielectric loss (ε''), ac conductivity (σ) were measured for NaP1 and Cu-NaP1 in the frequency range 20 Hz –1 MHz at room temperature. The conductivity of all the samples was studied. It is observed that the conductivity of NaP1 is less than Cu-NaP1 .It is attributed to greater homogeneity and smaller grain size.

Keywords: Fly Ash, Zeolite NaP1, conductivity, dielectric parameters,