

## **Effect of zeolite on the thermal properties of conducting polymer Polypyrrole**

### **ABSTRACT**

This Polypyrrole and Polypyrrole/Zeolite conjugated system were successfully synthesized through the chemical oxidation polymerization method. The structural, morphological and thermal properties of the synthesized compound were characterized by X-ray diffraction (XRD) analysis, Field Emission Scanning Electron Microscope (FESEM), Thermogravimetry Analysis (TGA) and Laser Flash Measurement. XRD confirmed the amorphous characteristic peak structure of Polypyrrole conjugated system at two theta  $\sim 25^\circ$ . The incorporation of Zeolite resulted in the presence of sharp peak which implies that Polypyrrole/Zeolite conjugated system has some degree of crystallinity and more ordered arrangement than those Polypyrrole conjugated system. The FESEM morphology showed the formation of Polypyrrole and Polypyrrole/Zeolite conjugated system revealing a globular and coiled structure images. Thermal transport property of thermal diffusivity has been measured ranging from room temperature up to 420 K while thermal stability through thermogravimetric analysis is measured from room temperature to 1273 K. The incorporation of Zeolite in conducting Polypyrrole shows an enhancement of thermal stability through laser flash measurement and thermogravimetric analysis. As Zeolite content increases in the Polypyrrole/Zeolite samples, the conjugation length increased hence improved the thermal diffusivity and the thermal stability of the sample.

**Keyword:** Polypyrrole; Zeolite; Conducting polymer; Conjugated system; XRD; FESEM; Thermal

