

Structure-property relation in HPMC:CoCl<sub>2</sub> polymer composites using functional data analysis

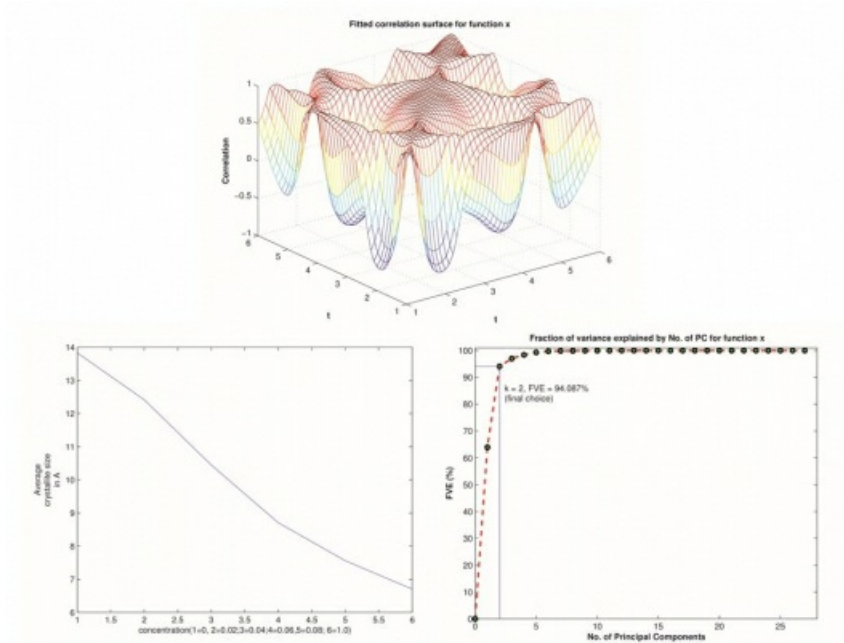
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Cobalt chloride doped HPMC polymer composites were characterized using various analytical studies. This includes, X-ray diffraction, conductivity, dielectric properties, mechanical strength and UV/Vis spectroscopy. These tests have been carried out to understand the changes in physical parameters of these composites, as an influence of doped CoCl<sub>2</sub>. Electrical conductivity, Impedance, dielectric loss and tensile strength of these films have been related with the microstructural parameters which are derived from the XRD line profile analysis. To efficiently state the structure dependence of these physical parameters, we have made use of Functional Data Analysis to validate such relation between the parameters. This study can be extended over any set of polymer composites to estimate the variations and dependency of structure on other physical parameters. Further, the study reveals that, cobalt chloride can be used as an effective dopant to modify conductivity in a non-conductive polymer.

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