C O N C L U S I O N S

The fluorescence for a coumarin derivative, 7,8-dihyroxy-4-methyl coumarin monomer (A) and its copolymer (A_1 through A_5), have been recorded and on the basis of the discussion provided for the emission spectra, the following conclusions have been drawn.

For the specimens in 'As Received' (powder) condition :

(1) It is observed that the four emission bands are exhibited by almost all the specimens, under the excitation of 280 nm. These emission bands are 320, 420, 480 and 520 nm.

(2) The 320 nm emission band is the effect of polymerization. The phonon-photon interaction taking place due to the vibration of long polymeric chains is responsible for this band. This band is absent in monomer specimen A.

(3) The 420 nm emission band is the effect of hydroxyl and methyl group present in all the specimens.

(4) The 480 nm emission band is due to the formation of esters during the process of polymerization. The band is absent in monomer specimen A.

(5) The 520 nm weak emission band is due to the carbonyl group present in the specimens.

For the specimens after Mechanical Deformation :

(6) The above bands are exhibited at 350, 420, 460 and 520 nm respectively.

(7) The overall intensity of the peaks drop compared to the earlier study.

(8) The drastic change in the above emission is due to the plastic deformation of the specimens.

(9) The mechanical deformations do not allow the weak band at 520 nm to grow sufficiently in intensity.

For the specimens after the Thermal Treatment :

(10) The bands are observed only at 440 and 500 nm emissions. These are the bands observed earlier at 420 and 480 nm respectively.

(11) The emission band at 320 and 520 nm are unobservable due to the effect of thermal treatment where the long polymer chains are broken into smaller chains.

(12) The changes taking place in the emission wavelength, intensities and positions are due to the configurational changes in specimens after the thermal treatment.

(13) A schematic energy level diagram showing the electronic states and transitions has been provided.

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