

STUDY ON RESONANCE RAMAN SPECTRA OF SOLUBLE POLYANILINE

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We report a systematic study of resonance Raman spectra of soluble polyaniline (PAN). Soluble PAN are prepared by the chemical oxidation of aniline and PAN obtained were characterized by IR and X-ray diffraction. For Raman spectra, the measured samples are soluble PAN powder and PAN chloroform solution. The exciting lines were argon ion laser with 488.0 and 514.5nm. The experimental results show the main Raman lines for exciting line with 488.0nm are observed at 3004cm^{-1} , 1500cm^{-1} , 1200cm^{-1} , 750cm^{-1} , 660cm^{-1} and 255cm^{-1} , but Raman spectra with excitation of 514.5nm are observed at 3008cm^{-1} , 1520cm^{-1} , 1210cm^{-1} , 750cm^{-1} and 660cm^{-1} .

We point out that the intensity of the Raman light scattering from localized vibrational modes in PAN molecule chain is expressed as a function of frequency shift, fractal and spectral dimensions. It was found for the first time that the low frequency Raman spectra are well explained in terms of a fracton description of localized vibrations. On the other hand, in high frequency region, the Raman lines in the spectra excited with the 514.5nm laser are slightly shifted as compared to the lines in the spectra excited with the 488.0nm laser because of the increase of the concentration of benzenoid ring and the resonance enhancement.

REFERENCE

1. B. B. Mandelbrot, The fractal geometry of Nature (Freeman, San Francisco, 1982).