

Electronic absorption and emission spectra of polymers containing polar pendant chromophores

YASUHIKO SHIROTA, FUJIO IINUMA, KAZUYUKI FUKUHARA and HIROSHI MIKAWA

Department of Applied Chemistry, Faculty of Engineering, Osaka University, Yamadakami, Suita, Osaka 565 (Japan)

In order to gain an insight into polymer effects on spectroscopic properties, the absorption and emission spectra of polymers containing polar pendant chromophores were studied for comparison with those of their low molecular weight model compounds. The vinyl polymers containing the pendant 1,3,5-triphenyl-2-pyrazoline and 2-methylindole chromophores were found to show no excimer fluorescence, emitting only normal fluorescences. Polymer effects on the spectroscopic properties were characterized by three features (relative to their low molecular weight model compounds): (1) a larger Stokes shift for the fluorescence; (2) lower sensitivity of the fluorescence band position to the change in the solvent polarity; (3) a decreased fluorescence quantum yield. These spectroscopic features, characteristic of the polymers, are understood in terms of the intramolecular solvation by the pendant chromophores.

Photobehaviour of polypeptides containing photochromic side chains

J.L. HOUBEN, A. FISSI and N. ROSATO

Istituto per lo Studio Proprietà Fisiche di Biomolecole e Cellule, Via San Lorenzo 26, 56100 Pisa (Italy)

Poly(L-glutamic acid) polymers ($M_v = 200\ 000$) were reacted with *p*-aminoazobenzene. Photochromic and circular dichroism (CD) properties were studied under various conditions of solvents and temperature. No significant variations in the absorption and photochromic properties of the polymers compared with the model compound were observed, indicating that the polymer matrix has little influence on these properties. Photoisomerization is thus statistical.

CD spectra above 250 nm are essentially due to exciton interactions between *trans* azo groups, as indicated by the influence of the azo content and of the *trans*:*cis* ratio on the corresponding couplet. In the 190 - 240 nm range the signal is mostly due to the peptide bond. In helicogen solvents it is markedly influenced by the azo content but not by the isomerization state. In suitable conditions it is possible to induce conformational changes in the polypeptide backbone by isomerization of the azo residues.