

## SYNTHESIS AND APPLICATION OF NEW SPIN PROBES

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Three non-ionic and two anionic spin probes, differing in size and substituent, were synthesized. Their mobility in dried nylon 6 film was investigated by the spin probe technique using electron spin resonance spectrometer. When the size of a spin probe was large and the interaction between the probe molecules and polymer chains existed, the mobility of spin probes decreased. From Arrhenius plots of rotational correlation time, one discontinuity point ( $T_d$ ) was determined. The activation energies for rotation below and above  $T_d$  were discussed in terms of the mode of probe rotation.

Three spin probes could be viewed as azo dyes having a built-in nitroxide radical. Photolysis of them in dimethylformamide and in nylon 6 film was performed by exposure to 254 nm UV light in the presence of air. It was found that dyes having a built-in nitroxide radical showed better photostability than dyes derived from  $\beta$ -naphthol.