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Synthesis, characterization and photoresponsive behavior of some polysulfones containing azobenzene moieties in the main chain

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ABSTRACT

New photoactive copolysulfones carrying azo crown ether moieties in the main chain were prepared by polycondensation reaction of 4,4'-bis(4-hydroxyphenylazo)dibenzo-18-crown-6, bisphenol A and bis(4-chlorophenyl)sulfone. The azo polysulfones were characterized via FTIR and ¹H NMR spectra, thermogravimetrical analysis and differential scanning calorimetry. The products showed good thermal stability, with 10 % weight loss temperatures ranging from 366 to 426 °C, while the glass transition temperatures varied from 137 to 158 °C. A kinetic study of *trans-cis-trans* isomerization process based on the evolution of the electronic absorption spectra during UV irradiation was conducted.

Keywords: polysulfone, azobenzene crown ether, photoisomerization, thermal relaxation, isomerization kinetics, complexation

1. Introduction

Polysulfones containing bisphenol A (Udel type) are high performance thermoplastics with excellent properties such as thermal and dimensional stability, high glass transition temperature and film forming ability, resistance to hydrolysis by acids or bases, inert behavior against various organic liquids (alcohols, esters, ethers) as well as high transparency and clarity. These polymers can be utilized in a wide range of applications including engineering plastics, optical materials, coating, membranes for gas separation, waste water treatment, food and beverage processing. Also, polysulfones can be used in automotive, aerospace, microelectronics or medical applications [1-11]. There is a continuous attraction in the modification of existing polysulfones in order to obtain

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