

Photoinduced chiral nematic organization in an achiral glassy nematic azopolymer

R.M. Tejedor^a, L. Oriol^{a*}, J.L. Serrano^{a*}, F. Partal Ureña^b, J.J. López González^{b*}

^a Polymer and Liquid Crystal Group, Facultad de Ciencias-Instituto de Ciencia de Materiales de Aragón, Universidad de Zaragoza-CSIC, Pedro Cerbuna 12, E-50009 Zaragoza, Spain.

^b Departamento de Química Física y Analítica, Facultad de Ciencias Experimentales, Universidad de Jaén, Campus Universitario de "Las Lagunillas" Edif. B-3, E-23071 Jaén, Spain

e-mail: loriol@unizar.es; jjlopez@ujaen.es

A liquid crystalline homopolymer that has photoisomerizable methoxyazobenzene groups in the side chain has been synthesized and characterized. Thin films of the nematic glassy phase of this polymer have been processed in order to study the absorption spectra and the vibrational and electronic circular dichroism responses by irradiation with 488 nm circularly polarized light (CPL). Selective reflection of visible light demonstrates that the irradiation of this glassy nematic azopolymer induces a helix

as a consequence of the chiral arrangement of the azobenzene units.¹ Moreover, a wedge cell with an aligning layer for planar orientation was filled with the polymer with the aim of investigating the change in the macroscopic optical properties and optical textures of the azopolymer on irradiation with CPL. The transfer of chirality from CPL to azopolymer through chiral conformations is proposed as a model for explaining the supramolecular chirality.

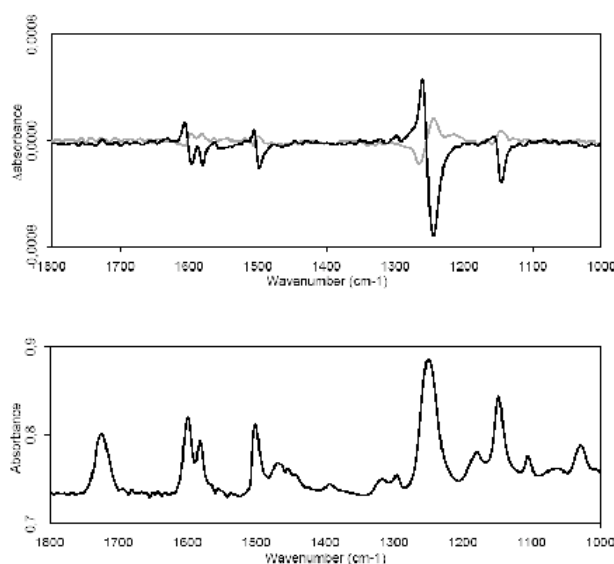


Fig.1 Proposed model for the photoinduction of chirality in azomaterials.

¹ R.M. Tejedor, M. Millaruelo, L. Oriol, J.L. Serrano, R. Alcalá, F.J. Rodríguez, B. Villacampa. *J. Mater. Chem.* 2006, 16, 1674-1680.

Acknowledgement: The authors are grateful to the CICYT-FEDER Spanish project (MAT2005-06373-C02) and the Government of Aragón and Andalucía. We also thank Professor R. Alcalá for laser facilities and helpful discussions and Dr. Ettore Castiglione for useful correspondence on VCD experimentation.