

عنوان مقاله:

Thermostable Polarizing Film on the Basis of Poly (vinyl alcohol) and New Dichroic Synthesized Azo Dye for Optical Applications: Theoretical and Experimental Investigations

محل انتشار:

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نویسندگان:

Siyamak Shahab - *Institute of Physical Organic Chemistry, National Academy of Sciences of Belarus, 13th Surganov Str., Minsk 220072*

Liudmila Filippovich - *Institute of Physical Organic Chemistry, National Academy of Sciences of Belarus, 13th Surganov Str., Minsk 220072*

Masoom Sheikhi - *Young Researchers and Elite Club, Gorgan Branch, Islamic Azad University, Gorgan, Iran*

خلاصه مقاله:

Quantum-chemical calculations using the Density Functional Theory (DFT) approach for structural analysis of the new dichroic mono azo dye: Sodium (E)-5-((4-carboxylatophenyl)diazenyl)-2-hydroxybenzoate (S) (trans isomer) was carried out using B3LYP methods with 6-311+G* basis set. After calculations, the new mono azo dye was synthesized. UV, FT-IR and 1H NMR spectra of the compound S are reported. The electronic spectrum of the mono azo dye S was also carried out in the water solution. Interpretation of absorption strips in UV region of spectrum was also reported. On the basis of the polyvinyl alcohol (PVA) and the new dichroic synthesized azo dye thermostable polarizer film absorbing in the UV region of spectrum ($\lambda_{max}=388$ nm) with effect of polarization (PE) in the absorption maximum 97% was developed. The main spectral-polarization parameters (transmittance, optical density) of stretched PVA-films were measured and discussed. It was also established that oriented colored PVA-films is phenomenon of anisotropy of thermal conductivity (\parallel / \perp). Thermal conductivity in the direction of orientation (\parallel) is higher than in the direction perpendicular to the orientations (\perp). The developed thermostable polarizer film was used in polarizing microscopes, circular polarizers, magnetometers, spectropolarimeters and electrical signals sensors.

کلمات کلیدی:

Thermostable polarizing PVA-film, DFT calculation, Thermal conductivity, UV-Vis spectrum

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