



4- Substituted 2-(((Phenyl)Imino)Methyl)-4-(p-Tolyldiazenyl)Phenols Based PMMA Thin Films: Synthesis and Linear/Nonlinear Optical Characterization



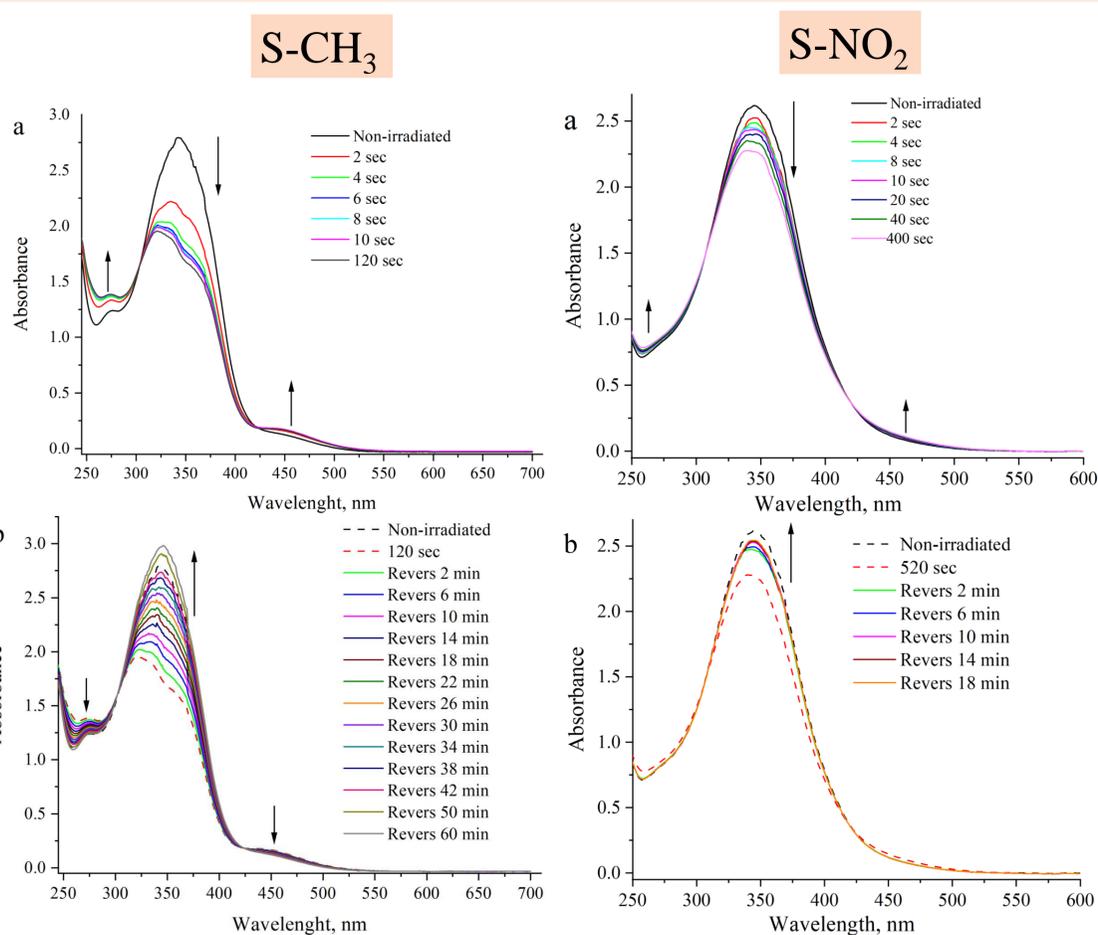
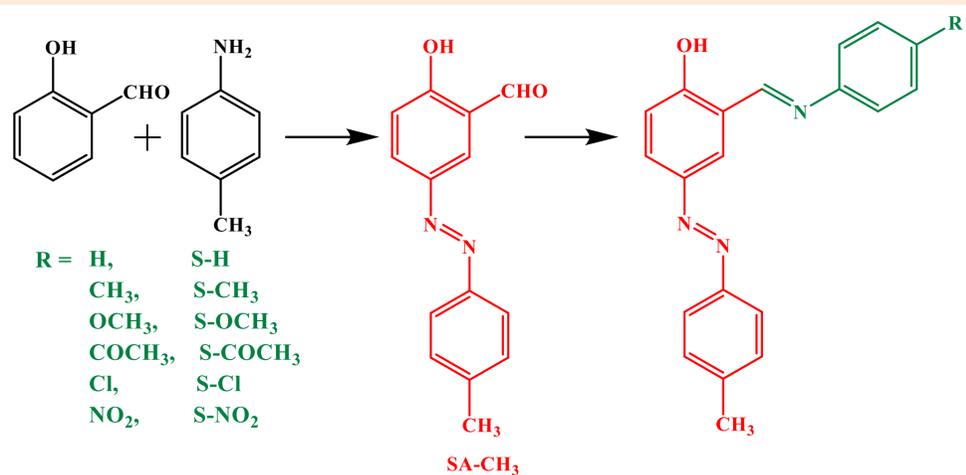
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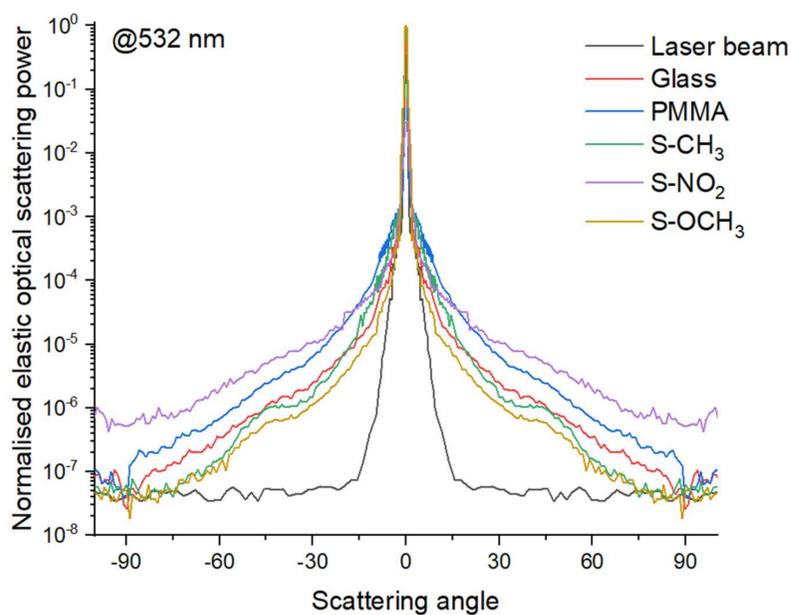
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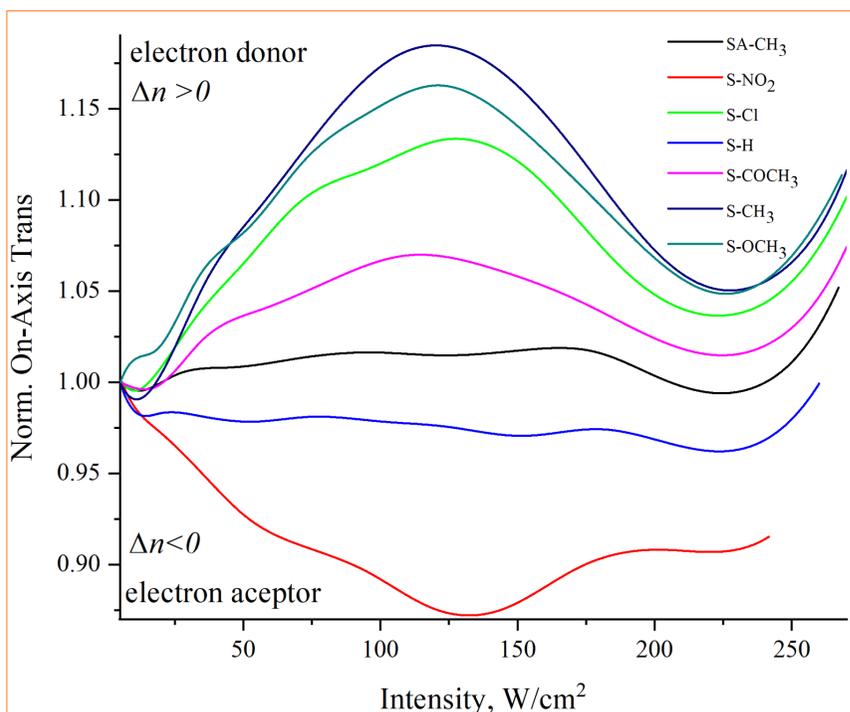
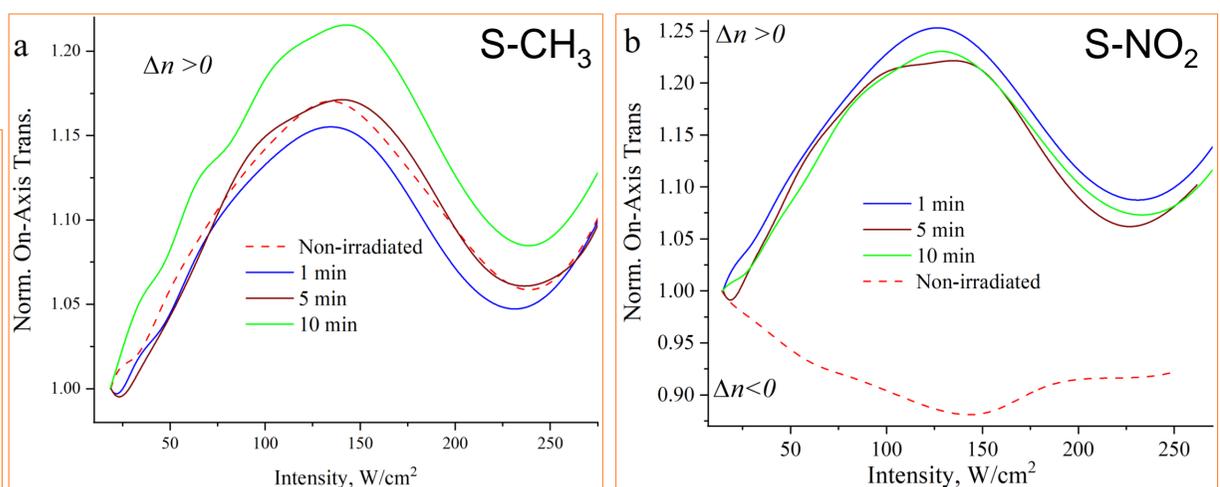
The series of para-substituted 2-(((phenyl)imino)methyl)-4-(p-tolyldiazenyl)phenols were synthesized by azo-coupling procedure of diazotated 4-toluidine with salicylic aldehyde with further condensation with substituted anilines. Photoinduced isomerization in THF solutions were studied. To determine the effect of the substituents donor-acceptor properties in the para-position to the imine bond on NLO characteristics, the effects of self-action in PMMA thin films with 1% (wt.) photoactive substance under the action of continuous laser radiation with $\lambda = 532$ nm were investigated.



Elastic Optical Scattering @ 532 nm



Photoinduced variations of on-axis transmittance in the far field: impact of UV irradiation



On-Axis transmission:
Refractive Response



Conclusions:

1. For azomethines with donor substituents in the para-position to the imino-group, as well as for unsubstituted azomethine, the rate of photoinduced isomerization is much higher than for azomethines with acceptor substituents. At the same time, azomethines with acceptor substituents show a much higher rate of reverse process.
2. An investigation of NLO self-action effects in thin polymer films of beforementioned compounds (1% in PMMA) showed that electron-donor substituents in the para-position to the imino-group contribute to significant self-focusing effect manifestation ($\Delta n > 0$), while electron-acceptor substituents to self-defocusing one ($\Delta n < 0$).
3. UV mercury lamp exposition promotes self-focusing effect manifestation, even switching from self-defocusing to self-focusing mode for S-NO₂.