



# Synthesis, Linear and Nonlinear Optical Response of New Azo-Benzoxazoles



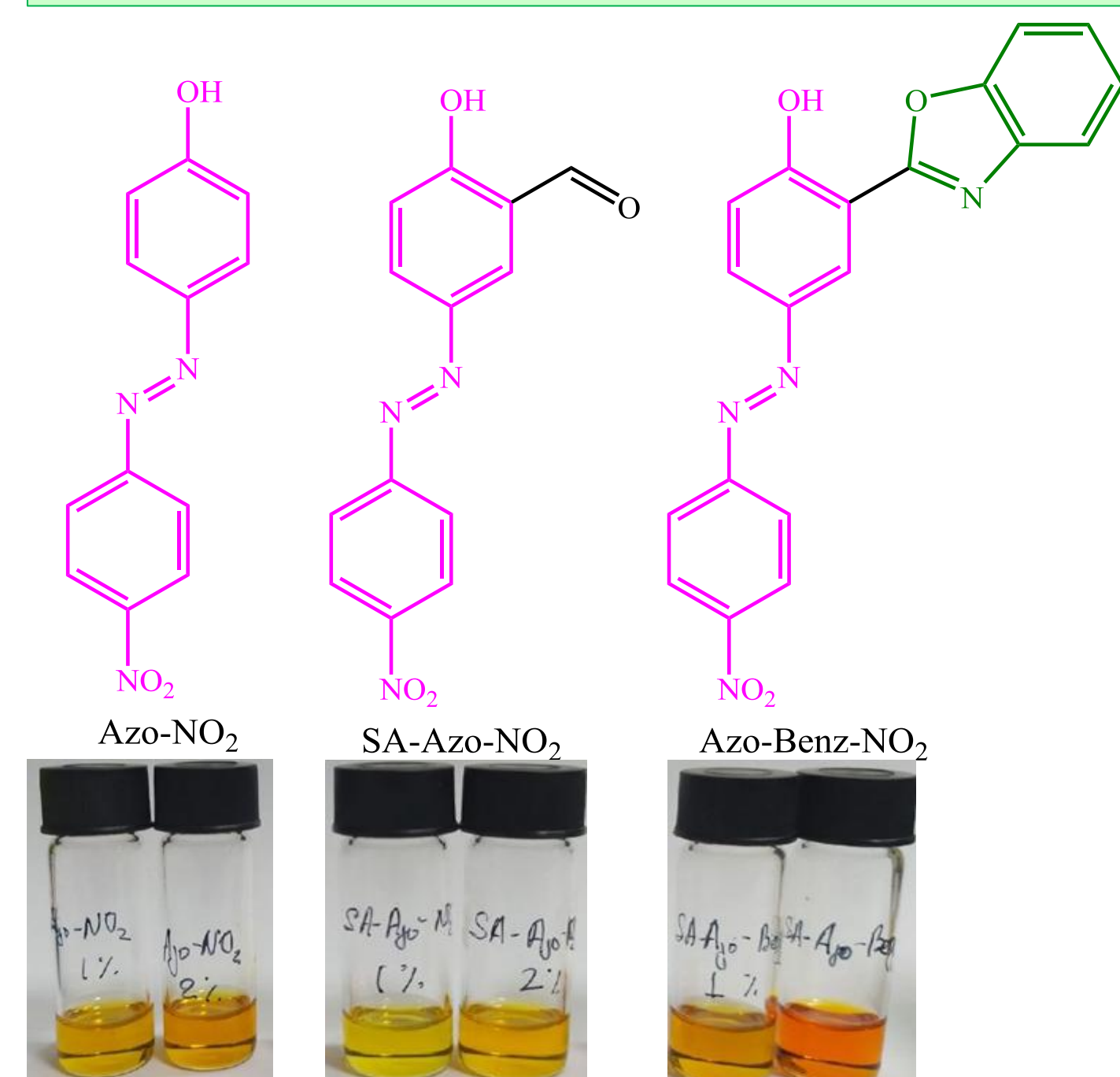
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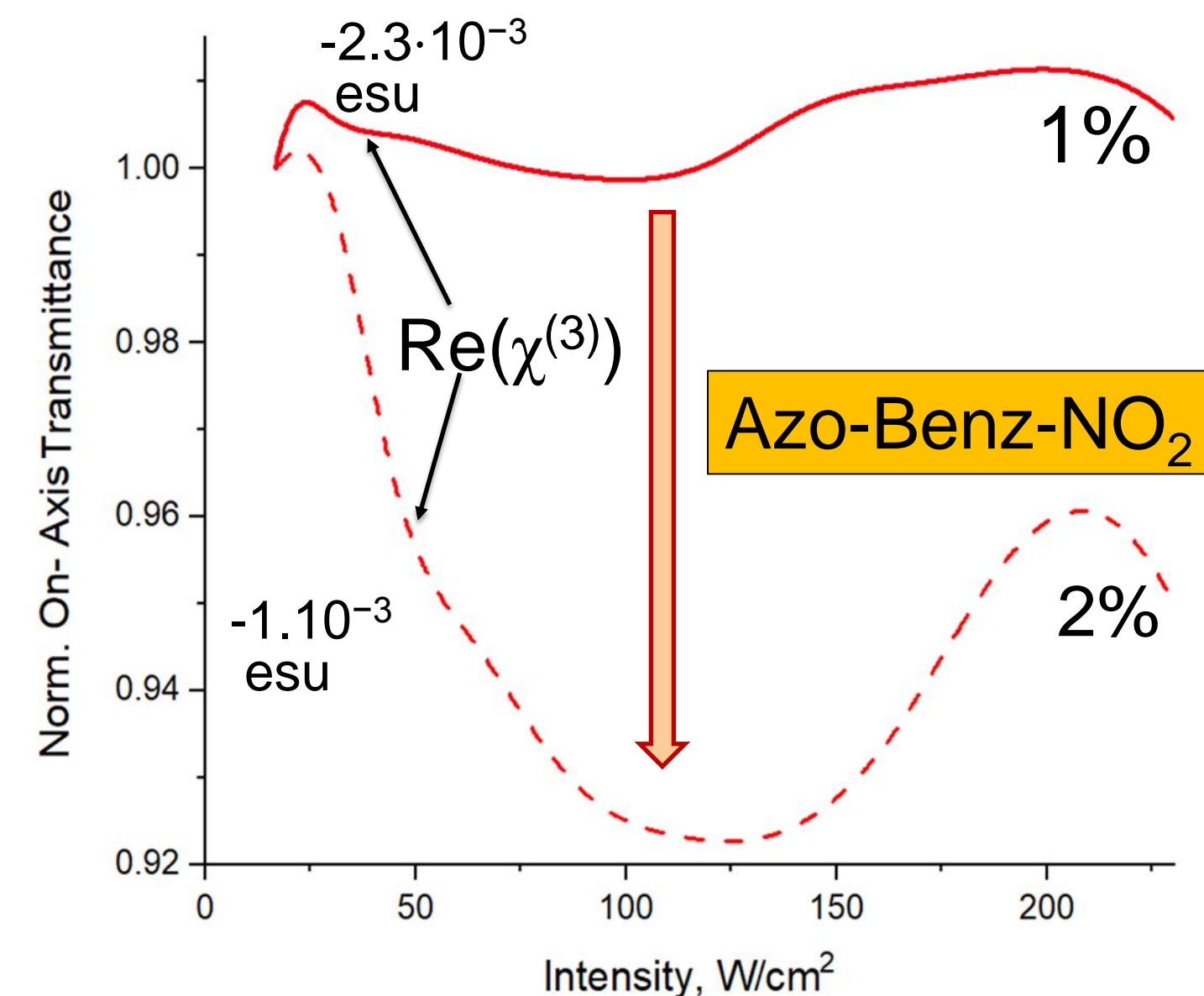
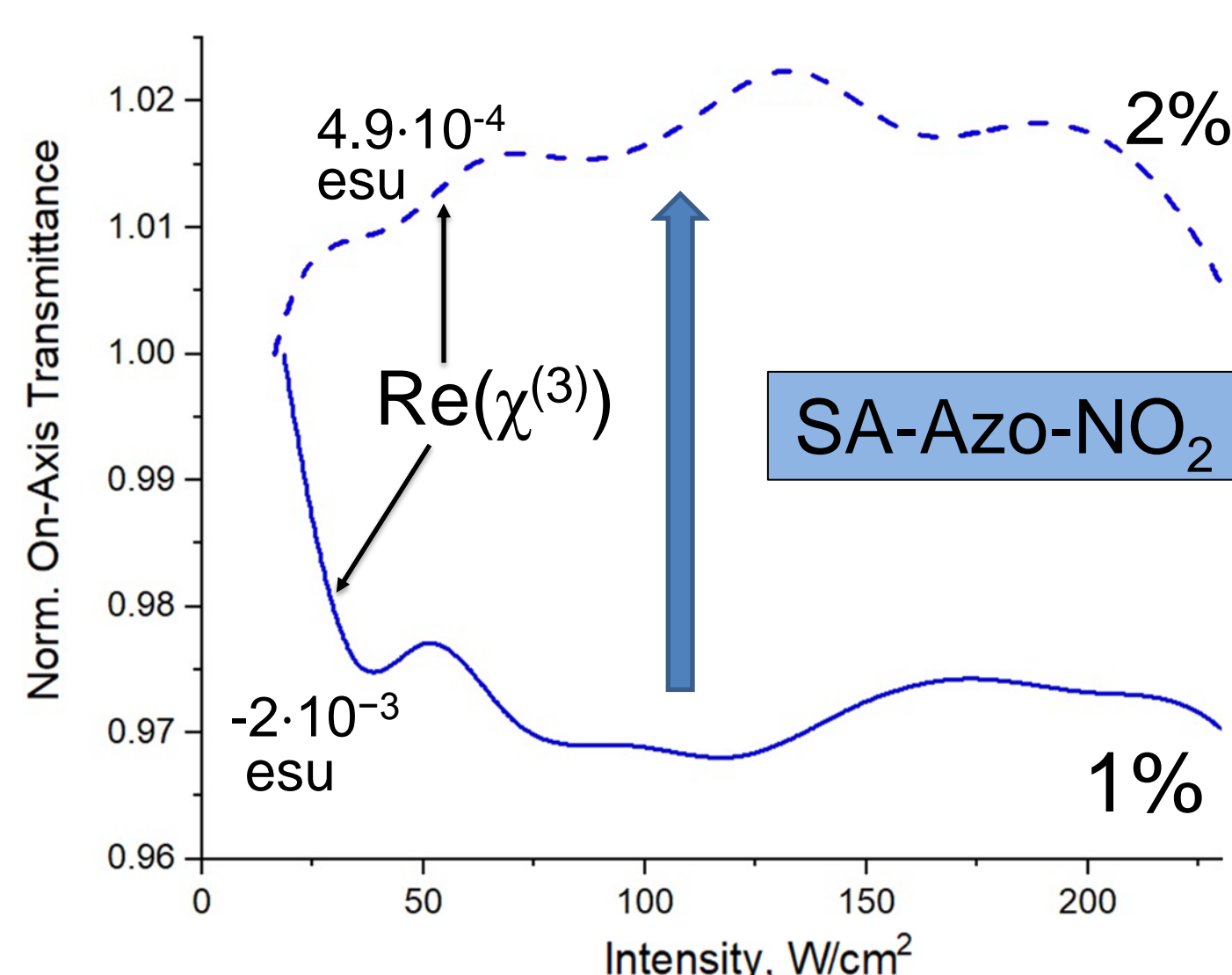
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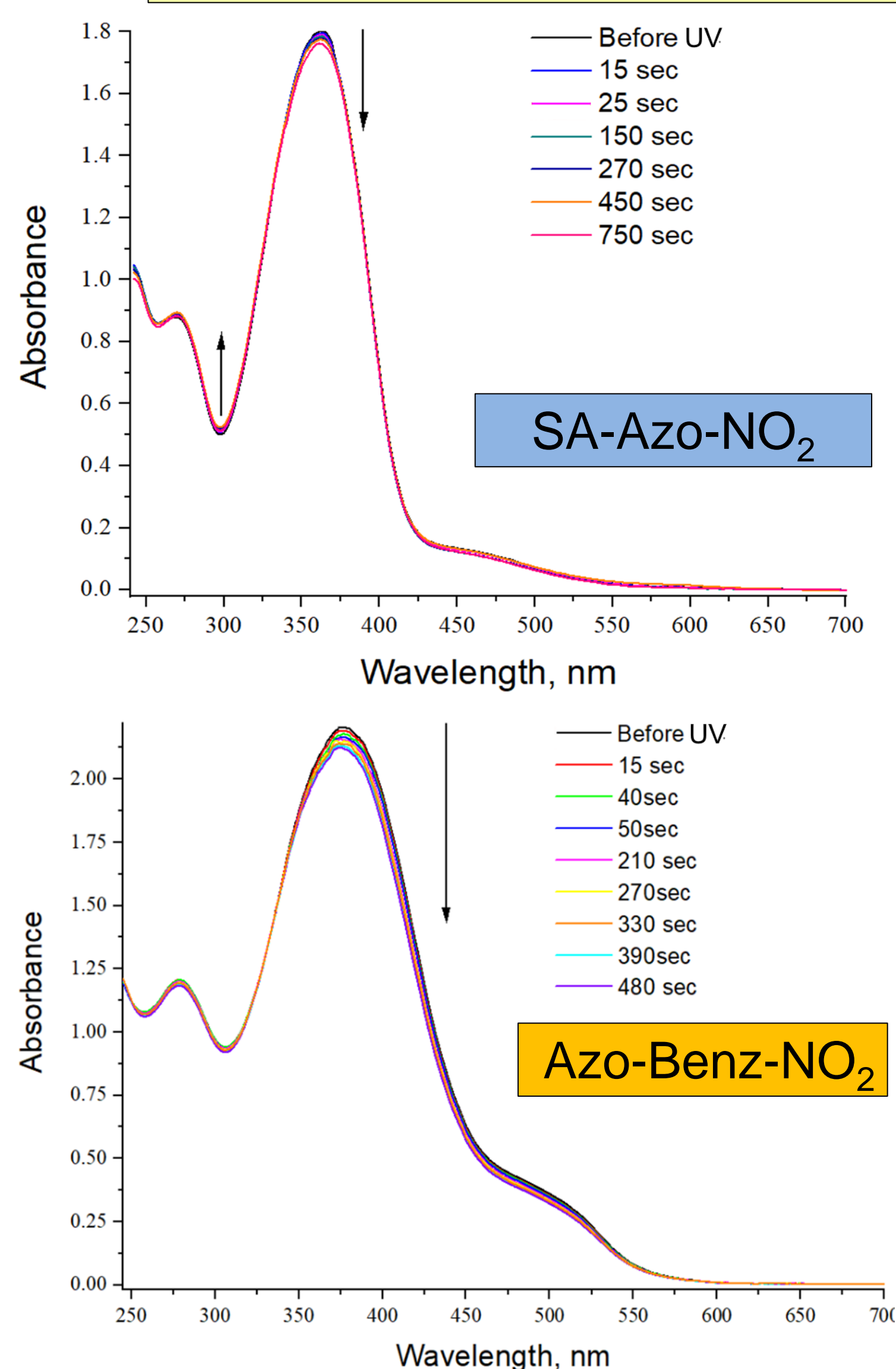
A series of azo compounds containing a heterocyclic moiety was obtained. The effect of the benzoxazole ring on both the rate of photoinduced isomerization and the nonlinear optical responses in thin films (1% in PMMA wt.) was investigated under CW laser excitation at 532 nm.



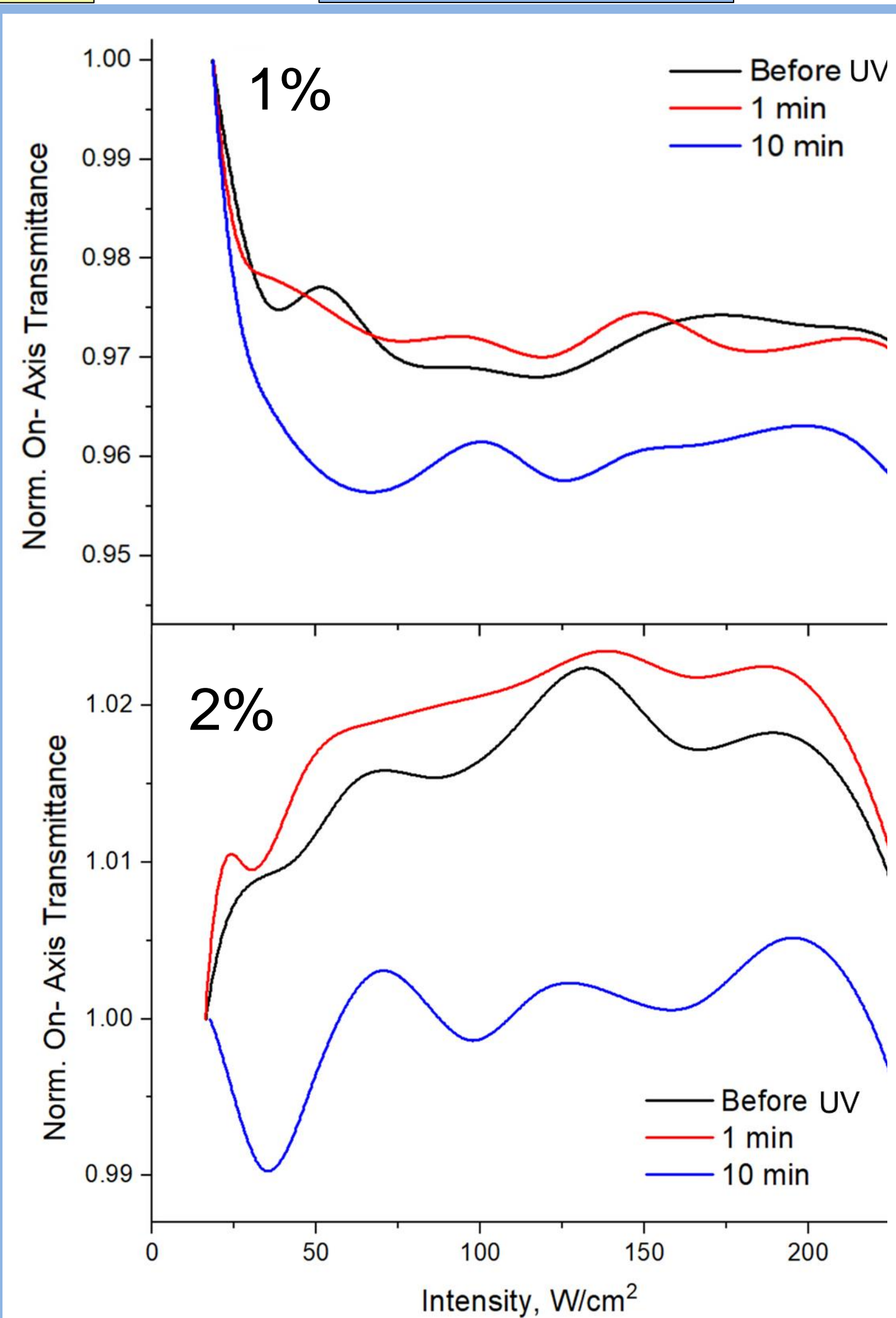
Photoinduced variations of on-axis transmittance in the far field



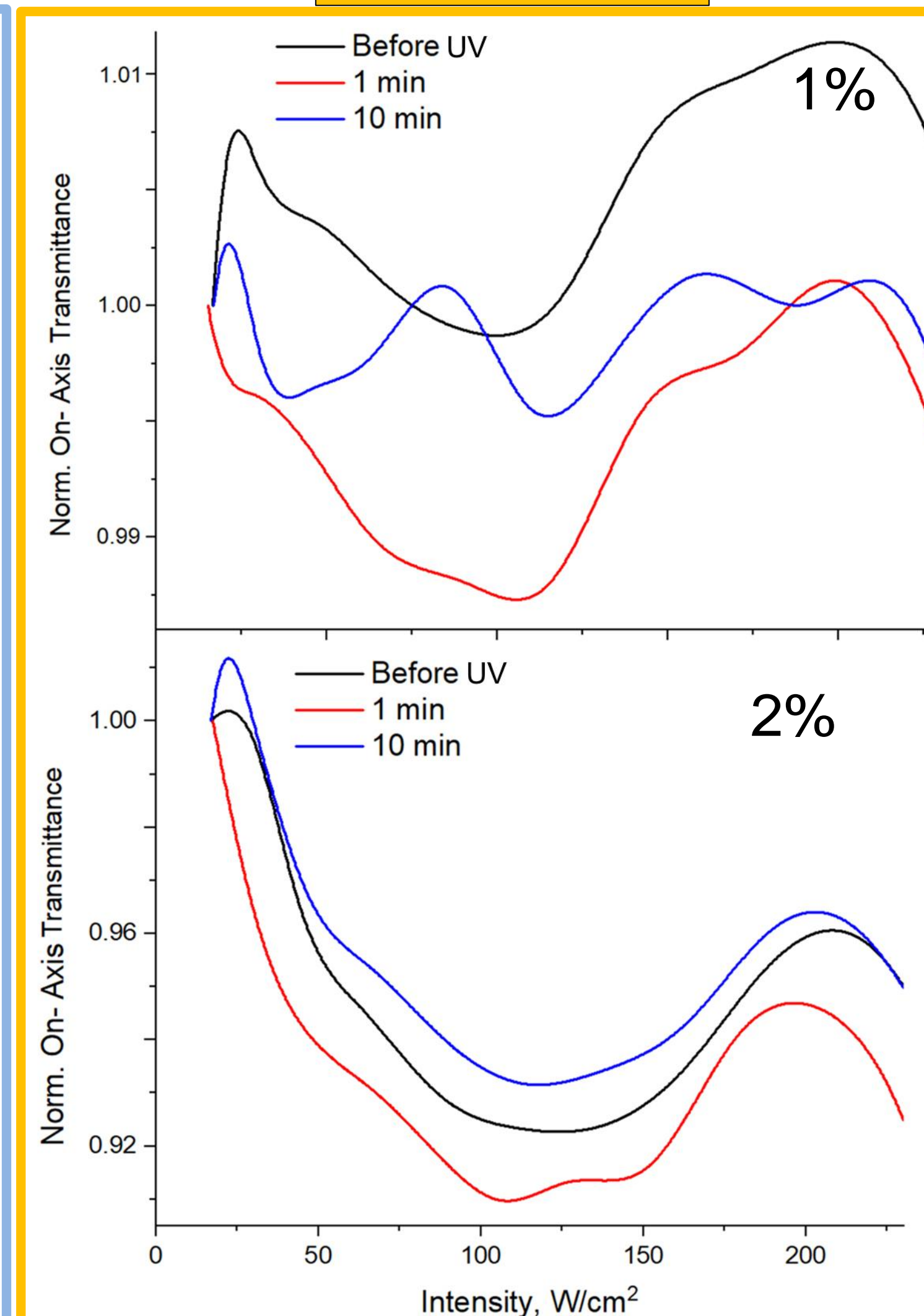
Photoinduced isomerization spectra of azo molecules under 390 nm UV light.



SA-Azo-NO<sub>2</sub>



Azo-Benz-NO<sub>2</sub>



## Conclusions:

1. For SA-Azo-NO<sub>2</sub> polymer composite containing aldehyde group increase in concentration from 1% to 2% promotes switching from self-defocusing ( $\Delta n < 0$ ) to self-focusing modes ( $\Delta n > 0$ ). It can be attributed to aldehyde group intermolecular nonspecific interactions.
2. The same concentration increase for Azo-Benz-NO<sub>2</sub> one provides rise of the self-defocusing effect manifestation ( $\text{Re}(\chi^{(3)}) = -1.8 \cdot 10^{-3}$  esu) that can be associated with cooperative phenomena.
3. UV irradiation with mercury lamp causes following changes in NLO refractive response. In SA-Azo-NO<sub>2</sub> polymer composite 1 min exposition produces no almost changes in photoinduced on-axis transmittance, whereas 10 min – provides self-defocusing effect manifestation. On the contrary, for Azo-Benz-NO<sub>2</sub> 1 minute of irradiation promotes an efficient self-defocusing effect due to more complex structure of benzoxazole-containing sample.