

Solvent dependent photochromism and emission of diarylethenes with a π -conjugated push-pull system

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Introduction of push-pull system between carbonyl and dimethylamino groups in the ethene bridge of diarylethene (DAE) provides access to fluorescent switches, responsible for various stimuli (UV and visible light, solvent polarity, pH). A study of luminescent and photochromic properties of three cyclopentenone-based derivatives was performed (Figure 1, [1]). The ICT (intramolecular charge transfer) excited state is responsible for emission, determining strong dependence of emissive properties vs. solvent polarity. Kinetic behavior of luminescence was explained by the model based on the equilibrium between two isomers of the DAEs open form. Dialkylaminobenzylidene moiety, conjugated with cyclopentenone bridge, provides unique combination of bidirectional manipulation by visible light only and complex switching behavior.

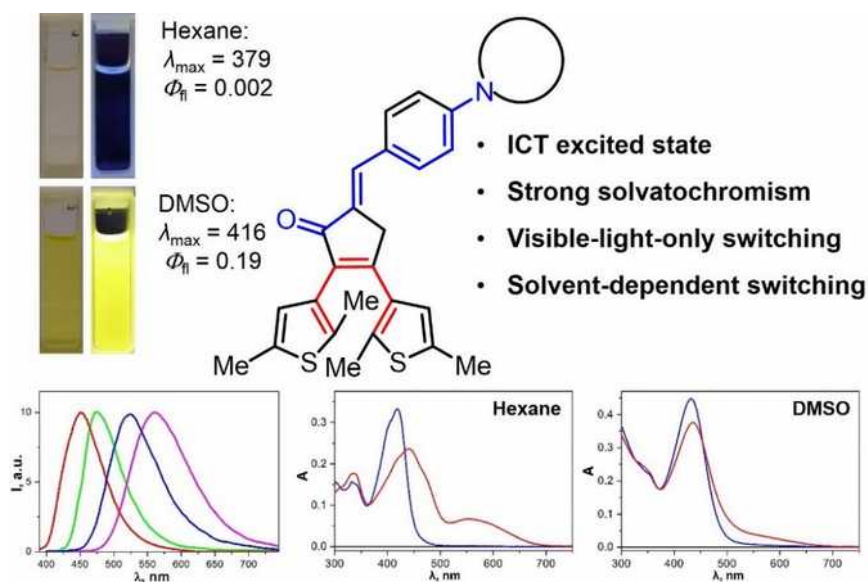


Figure 1. Solvatochromic and photochromic properties of luminescent DAEs.

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[1] E.M. Glebov, V.V. Semionova, S.K. Lazareva, A.B. Smolentsev, R.G. Fedunov, V.Z. Shirinian, A.G. Lvov, *J. Lumin.* **2022**, *241*, Article 118472.