

Technology Opportunity, Ref. No. UA-17/354

Water-Soluble, Organic Fluorophores with High Stokes Shift for Microscopy, Safety Marks and Other Applications

Our water-soluble small-molecule organic dyes feature an unprecedented substitution pattern leading to photochemical properties unique from known organic dyes. They have shown utility as precision fluorophores for microscopy and other applications.

Keywords Fluorophore, Dye, Fluorescent Dye, Bioimaging, Microscopy, Security Dye

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Reference *Angew. Chem. Int. Ed.* **2018**, doi: 10.1002/ange.201711296.

Background Organic fluorophores often suffer from small Stokes shifts, which limits their use in e.g. light microscopy or bioassays.

Invention The inventors discovered unprecedented water-soluble organic fluorophores. Structural variation allows adjustment of the electrochemical and photophysical properties:

Dye	$E_{1/2}(*C/C^-)$	$E_{1/2}(C/C^-)$	λ_{abs}	λ_{em}	Stokes Shift
1	+1.94 V	-0.48 V	473 nm	598 nm	125 nm
2	+1.81 V	-0.52 V	497 nm	576 nm	79 nm
3	+1.76 V	-0.47 V	503 nm	595 nm	92 nm
4	+1.89 V	-0.44 V	490 nm	570 nm	80 nm
5	+1.52 V	-0.83 V	506 nm	547 nm	41 nm
6	+1.31 V	-0.94 V	501 nm	584 nm	83 nm
7	+1.21 V	-1.20 V	498 nm	539 nm	41 nm
8	+1.02 V	-1.27 V	513 nm	595 nm	82 nm

The fluorophores with increased Stokes shifts in the range of 40-90 nm allow fluorescent imaging with improved precision, accuracy and brightness.

Fields of Use Fluorescent dyes and labels for bioimaging, security dyes

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