Product Data Sheet

Product Name: D149 Dye
Cat. No.: GC35796

Chemical Properties

Cas. No.	786643-20-7		
SMILES	S=C(S/C1=C(N(C/2=O)CC(O)=O)\SC2=C\C3=CC4=C(N(C5=CC=C(/C=C(C6=CC=CC=C6)\C7=CC=CC=C7)C=C5)[C@]8([C@@]4(CCC8)[H])[H])C=C3)N(C1=O)CC		
Formula	$C_{42}H_{35}N_3O_4S_3$	M.Wt	741.94
Solubility	DMSO: 1 mg/mL (1.35 mM); Water: < 0.1 mg/mL (insoluble)	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	D149 Dye		

Protocol

Cell experiment: The porous TiO2 films are immersed in a 0.5 mM D149 (1-material) dye solution in a 1:1 (v/v) mixture of acetonitrile (HPLC) and tert-butanol (LR) overnight once their temperature decreased to approximately 110°C. The samples are then taken out of the dye bath, washed with acetonitrile, and dried. The working electrode and Pt counter electrode [produced using a pre-drilled piece of 2.3 mm FTO glass, coated with one drop of 10 mM platinic acid solution [H2PtCl6] and heated to 400°C for 20 min] are assembled into a sandwich type cell and sealed with a spacer of 25 μm Surlyn. An I-1/I3-1 organic solvent based electrolyte solution [50 mM iodine, 0.6 M 1,2-dimethyl-3-propylimidazelium iodide, 0.1 M lithium iodide in methoxypropionitrile] is introduced via vacuum back-filling. The hole is sealed with a piece of aluminium foil-backed Surlyn[1].

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References:

[1]. Lin J, et al. 3D hierarchical rutile TiO2 and metal-free organic sensitizer producing dye-sensitized solar cells 8.6% conversion efficiency. Sci Rep. 2014 Aug 29;4:5769.
[2]. El-Zohry A, et al. Isomerization and Aggregation of the Solar Cell Dye D149. J Phys Chem C Nanomater Interfaces. 2012 Dec 20;116(50):26144-26153.

Background

D149 Dye is an indoline-based dye, which is a high-extinction-coefficient metal-free organic sensitizer.

D149 is a metal-free organic dye, which is promising all-organic alternatives. D149 displays power conversion efficiency of up to 9%. Furthermore, D149 has a peak extinction co-efficient of 68700 M-1 cm-1 at 540 nm, significantly higher than 13900 M-1cm-1 at 535 nm for N719[1]. D149, a metal-free indoline dye, is one of the most promising sensitizers for dye-sensitized solar cells (DSSCs) and has shown very high solar energy conversion efficiencies of 9%. D149 shows a large number of unresolved aromatic and olefinic signals between 7 and 7.5 ppm[2]

[1]. Lin J, et al. 3D hierarchical rutile TiO2 and metal-free organic sensitizer producing dye-sensitized solar cells 8.6% conversion efficiency. Sci Rep. 2014 Aug 29;4:5769. [2]. El-Zohry A, et al. Isomerization and Aggregation of the Solar Cell Dye D149. J Phys Chem C Nanomater Interfaces. 2012 Dec 20;116(50):26144-26153.

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