

PYRROMETHENE 580

Chemical Name: 1,3,5,7,8-pentamethyl-2,6-di-n-butylpyrromethene-difluoroborate complex

MW: 374.32

Melting Point: 182.5-183.5°C

CAS Registry Number: 151486-56-5 **Exciton Catalog No.:** 05805

Synonyms: PM-570, PM-580

Spectral Information:

$\lambda_{\text{max,abs}} = 518\text{nm}$ (Ethanol)²¹⁸
 $\epsilon_{518} = 8.3 \times 10^4 \text{ liter mol}^{-1} \text{ cm}^{-1}$ ²¹⁸
 $\lambda_{\text{max,fl}} = 550\text{nm}$ (Ethanol)²¹⁸
 $\Phi_f = 0.90$ (Ethanol)²¹⁸

Selected Solubility Limits (25°C):

Solvent	Concentration	$\lambda_{\text{abs max}}$
Methanol	320mg/liter	518
Ethanol	540mg/liter	519
NMP	8.9g/liter	520
EPH	5.9g/liter	524
PPH	7.7g/liter	524
p-Dioxane	12.2g/liter	521
Propylene Carbonate	~1.5	524

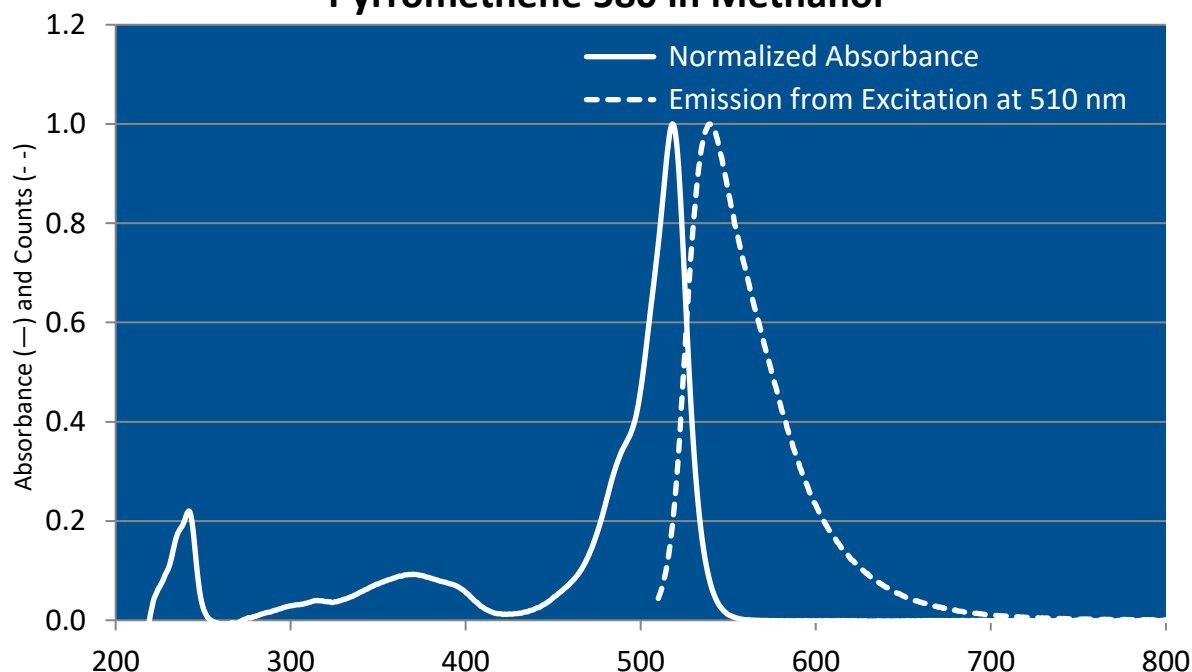
Lasing Wavelength

Max. (nm)	Range (nm)	Pump Source (nm)	Solvent	Concentration (molar)	Conversion Efficiency	Stability (1/2- life)
580(bb)		FL ²¹⁸	Ethanol	2×10^{-4}	-	-
		Nd:YAG(532) ²²⁰	Ethanol	3×10^{-4}	83.5%	-
552	545-585	Nd:YAG(532) ²²³	Ethanol	8.6×10^{-4} (osc), 1.2×10^{-4} (amp)	38%	850KJ/L
557	547-581	Nd:YAG(532) ²³⁹	Ethanol	5.3×10^{-4}	28%	-
569	545-583	Nd:YAG(532) ²²³	Ethanol	8.6×10^{-4} (P-580,osc), 4.5×10^{-5} (P-597,amp)	31%	-
570(bb)		Nd:YAG(532) ²¹⁵	Acrylic Copolymer	3.2×10^{-4}	85.0% ^s	See note B
571(bb)		Nd:YAG(532) ²¹⁹	Acrylic Copolymer	3.2×10^{-4}	82.5% ^s	See note A
575	555-592	Ar(all-lines) ²²¹	PPH	2.8×10^{-3}	31% ^s	ca. 200Wh

bb (broad band); s (slope efficiency)

EPH (2-Phenoxyethanol); NMP (N-Methyl-2-Pyrrolidinone); PPH (1-Phenoxy-2-Propanol)

Pyrrromethene 580 in Methanol



The information presented above is believed to be accurate but is not a specification. The customer is fully responsible for determining the suitability of this product for use in their application. Exciton, Inc. does not represent that the information is sufficient or complete for any specific application.

Quantum Yields and Lifetimes

Absorbance (nm)	Emission (nm)	Quantum Yield (max = 1.0)	Solvent	Lifetime (ns)	References, Notes
518	550	0.9	Ethanol	218	catalog reference

REFERENCES:

215. High-Efficiency Pyrromethene Doped Solid-State Dye Lasers, R.E. Hermes, T.H. Allik, S. Chandra, J.A. Hutchinson, *Appl. Phys. Lett.*, 63(7), 877 (1993). [Non-Commercial Dye Laser]
218. Pyrromethene-BF₂ Complexes as Laser Dyes:2, J.H. Boyer, A.M. Haag, G. Sathyamoorthi, M.-L. Soong, and K. Thangaraj, *Heteroatom Chem.*, 4(1), 39 (1993). [Non-Commercial Dye Laser]
219. Efficient and Robust Solid-State Dye Laser, T.H. Allik, S. Chandra, R.E. Hermes, J.A. Hutchinson, M.-L. Soong, and J.H. Boyer, *OSA Proc. on Adv. Solid-State Lasers*, 15, 271 (1993). [Non-Commercial Dye Laser]
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221. M.D. Shinn, Bryn Mawr College, private communication, 1994. [Coherent 599 Dye Laser]
223. Performance of Pyrromethene 580 and 597 in a Commercial Nd:YAG-pumped Dye-laser System, W.P. Partridge Jr., N.M. Laurendeau, C.C. Johnson, and R.N. Steppel, Accepted for publication, *Applied Optics*, 1994. [Quanta-Ray PDL-3 Dye Laser]
239. Paulus Jauernik, private commun., Sirah Laser- und Plasmatechnik, 2003.

For a current list of biology, biological stain, or biochemistry references for Pyrromethene 580 from PubMed, click on the following link:

[Pyrromethene 580](#) (zero references listed in PubMed as of May 2006)

NOTES:

- A. After 20,000 pulses at 0.6J/cm², output energy had reduced by only 34%.
 - B. After 20,000 pulses at 75mJ/cm², output energy had reduced by approximately 33%.
- Pyrromethene 580 is offered by Exciton under U.S. Patent Nos. 4,916,711 and 5,189,029 and other worldwide patents.
 Use of EPH and/or PPH as a laser dye solvent is subject to U.S. Patent No. 4,896,329 (Exciton).