

COUMARIN 460

Synonym: 7-(diethylamino)-4-methyl-2H-1-benzopyran-2-one; Coumarin 1; Coumarin 47

Catalog No.: 04600

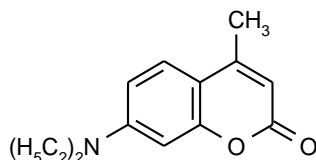
CAS No.: 91-44-1

MW: 231.30

Chemical Formula: C₁₄H₁₇NO₂

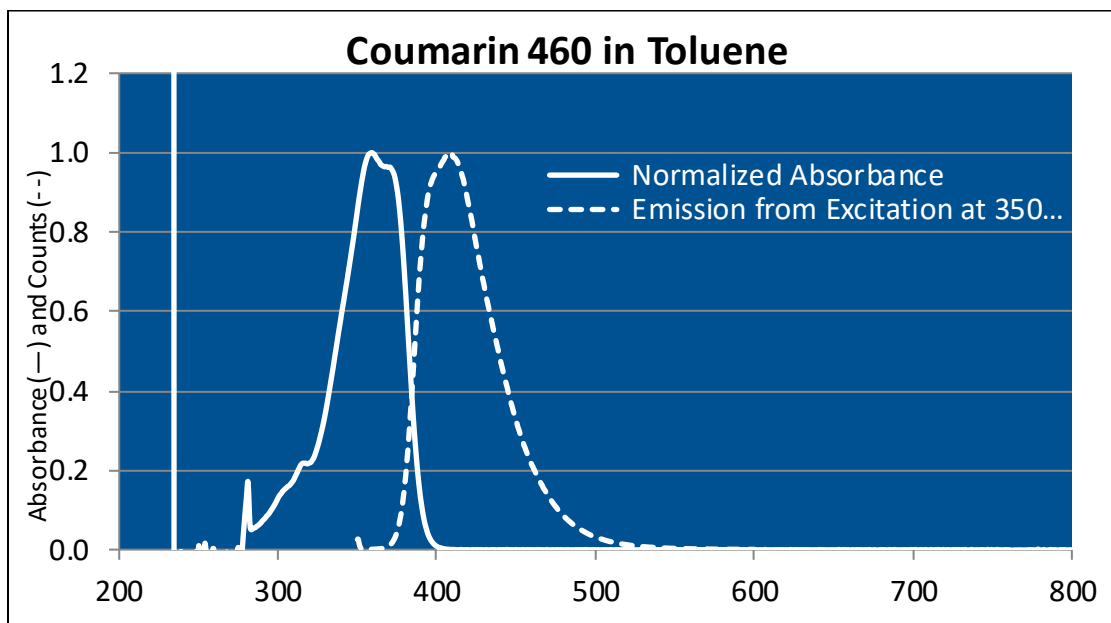
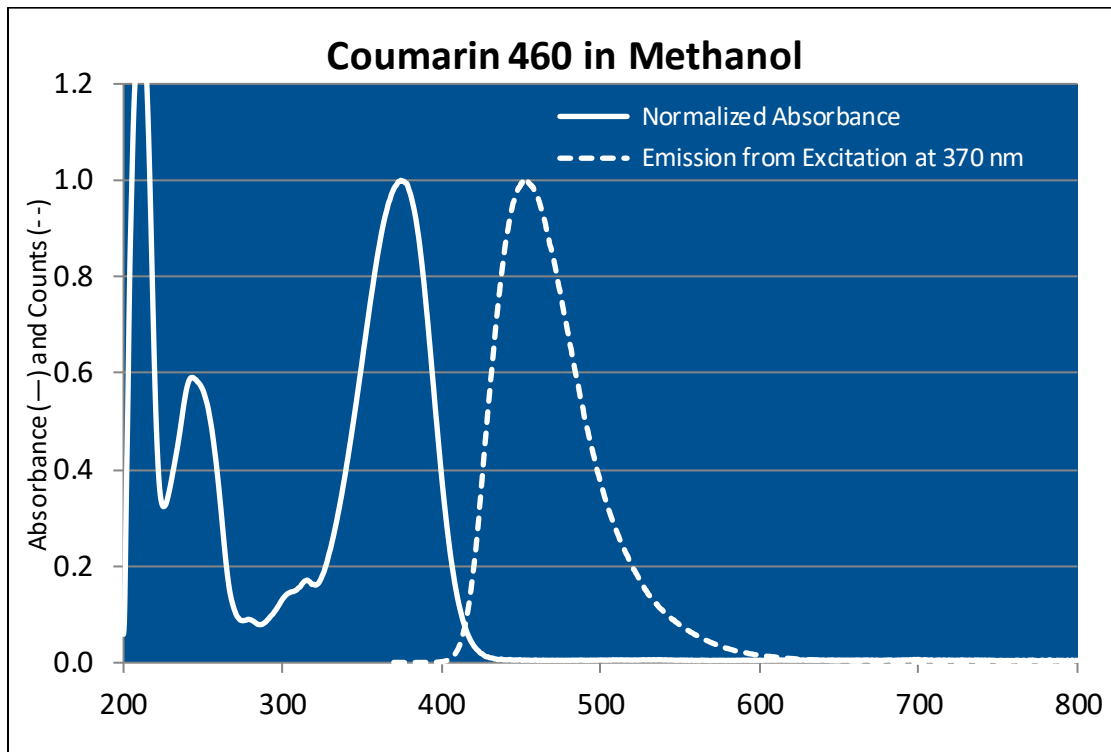
Appearance: White crystalline powder

Structure:



Lasing Wavelength Max. (nm)	Range (nm)	Pump Source (nm)	Solvent	Concentration (molar)	Abs λ-max	FI λ-max
457	450-484	FL ³	Ethanol	1.5 x 10 ⁻⁴	373 ^e	445 ^e
460		FL ⁶³	Ethanol	2 x 10 ⁻⁴	375 ^m	395 ^{c82}
461	448-489	FL ³	Methanol	1.5 x 10 ⁻⁴		416 ^y
456		XeCl(308) ¹¹²	Ethanol	4 x 10 ⁻³		434 ⁿ
460	438-495	XeCl(308) ¹¹⁸	Ethanol	1.1 x 10 ⁻² (osc)		451 ^e
460	441-498	XeCl(308) ¹¹⁴	Methanol	7 x 10 ⁻³		458 ^{e/w}
460	442-482	XeCl(308) ¹¹⁰	Ethanol	3 x 10 ⁻³		463 ^g
460	443-481	XeCl(308) ¹¹⁰	Methanol	3 x 10 ⁻³		
462	437-495	XeCl(308) ²⁰⁴	Methanol	5 x 10 ⁻³ (osc), 4.5 x 10 ⁻³ (amp)		
457	440-478	XeF(351) ¹⁵⁴	Ethanol	1 x 10 ⁻³		
454	440-475	Nd:YAG(355) ¹⁰⁹	Ethanol	5 x 10 ⁻³		
457		Nd:YAG(355) ⁵⁹	Ethanol	7 x 10 ⁻⁴		
459	443-485	Nd:YAG(355) ¹¹⁰	Methanol	4 x 10 ⁻⁴		
460	442-479	Nd:YAG(355) ²³⁹	Ethanol	1.1 x 10 ⁻³		
460	444-480	Nd:YAG(355) ⁵⁷	Methanol	1.3 x 10 ⁻³ (osc), 2.6 x 10 ⁻⁴ (amp)		
461	442-490	Nd:YAG(355) ⁵³	Methanol	1.6 x 10 ⁻³ (osc), 5.6 x 10 ⁻⁴ (amp)		
457	440-478	N ₂ (337) ⁵	Ethanol	1 x 10 ⁻²		
460	436-498	N ₂ (337) ¹¹⁴	Ethanol	3.5 x 10 ⁻³		
464	434-500	N ₂ (337) ⁹⁰	Ethanol	4.5 x 10 ⁻³		
475	450-510	N ₂ (337) ¹⁸³	Methanol	50mg/20ml		
470	450-495	Ar or Kr(uv) ¹⁷	EG	3 x 10 ⁻³		
472	446-506	Ar(cw) ¹⁴	EG			
471	448-505	Kr(uv) ⁶⁸	MeOH/EG	80% pump absorption		

EG=ethylene glycol, MeOH=methanol, e=ethanol, m=methanol, c=cyclohexane, y=ethyl acetate, n=acetonitrile, e/w=ethanol/water, g=glycerol



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
350	395	0.49	Cyclohexane	2.8	C-2a
	395	0.32	Cyclohexane	2.8	C-4
361	416	0.99	Ethyl Acetate	3.1	C-2a
	416	0.93	Ethyl Acetate	3.1	C-4
367	430	1.03	Acetonitrile	3.4	C-2a
	434	0.73	Acetonitrile	3.4	C-4
373	451	0.73	Ethanol	3.1	C-2a
	445		Ethanol	3.2	C-3
	451	0.59	Ethanol	3.1	C-4
374		0.67	Ethanol		C-5
373	448	0.57	Ethanol		C-7c
373	448	0.79	Ethanol		C-7a
373	448	0.85	Ethanol		C-7b
381	454	0.3	50% ethanol	1.4	C-2a
	458	0.22	Ethanol/Water (50:50)	1.4	C-4
382	456	0.11	20% ethanol	0.7	C-2a
		0.11	Ethanol/Water (20:80)	0.7	C-4
380	456	0.055	Water	---	C-2a
384	463	0.58	Glycerol	3.8	C-2a
	463	0.53	Glycerol	3.8	C-4

REFERENCES:

3. Phase-R Corporation, Box G-2 Old Bay Rd., New Durham, NH 03855
5. Laser Photonics, Inc., 12351 Research Parkway, Orlando, FL 32826, formerly, Molelectron Corporation and Cooper LaserSonics, Inc.
14. CW Laser Emission Spanning the Visible Spectrum, J.M. Yarborough, *Appl. Phys. Lett.*, 24(12), 629 (1974). a. With Rhodamine 6G
17. Spectra-Physics, 1250 W. Middlefield Road, Mountain View, CA 94039
53. Continuum, 3150 Central Expressway, Santa Clara, CA 95051, formerly, Quantel International
57. Quanta-Ray, Note: Quanta-Ray is now incorporated as a part of Spectra-Physics, 1250 W. Middlefield Road, Mountain View, CA 94039
59. 3547-Å Pumped High-Power Dye Laser in the Blue and Violet, K. Kato, *IEEE J. Quantum Electron.*, QE11, 373 (1975)
63. High Energy Pulsed Dye Lasers for Atmospheric Sounding, J.Y. Allain, *Appl. Optics*, 18(3), 287 (1979)
68. Coherent Inc., 3210 Porter Dr., Palo Alto, CA 94304
82. Medium Effects on Fluorescence Quantum Yields and Lifetimes for Coumarin Laser Dyes, G. Jones II., W.R. Jackson and A.M. Halpern, *Chem. Phys. Lett.*, 72(2), 391 (1980)
90. Jobin Yvon, 16-18 rue du Canal B.P. 118, 91163 Longjumeau Cedex France

109. Tuning Ranges of 355 nm Pumped Dyes from 410-715 nm, D.M. Guthals and J.W. Nibler, *Optics Commun.*, 29(3), 322 (1979)
110. Lumonics Inc., 105 Schneider Road, Kanata, (Ottawa), Ontario, Canada K2K 1Y3
112. Efficient Dye Lasers Pumped by an XeCl Excimer Laser, O. Uchino, T. Mizunami, M. Maeda and Y. Miyazoe, *Appl. Phys.*, 19, 35 (1979)
114. Optimization of Spectral Coverage in an Eight-Cell Oscillator-Amplifier Dye Laser Pumped at 308nm, F. Bos, *Appl. Optics*, 20, 3553 (1981)
118. The XeCl Excimer Laser: A Powerful and Efficient UV Pumping Source for Tunable Dye Lasers, H. Telle, W. Huffer and D. Basting, *Optics Commun.*, 38(5,6), 402 (1981)
154. Dye Laser Radiation in the 370-760nm Region Pumped by a XeF Excimer Laser, T.C. Eschrich and T.J. Morgan, *Applied Optics*, 24(7), 937 (1985)
183. Thermo Laser Science, 26 Landsdowne Street, Cambridge, MA 02139
204. Questek, Inc., 44 Manning Road, Billerica, MA 01821 (Tuning Curves for Model 5200B Dye Laser, PDL-3)
- 239 P. Jauernik, private commun., Sirah Laser- und Plasmatechnik, 2003.
- C-2a. Solvent Effects on Emission Yield and Lifetime for Coumarin Laser Dyes, Requirements for a Rotatory Decay Mechanism, Guilford Jones II, W.R. Jackson, C-Y. Choi and W.R. Bergmark, *J. Phys. Chem.* 89(2), 294-300 (1985); <https://doi.org/10.1021/j100248a024> **Note A:** Argon purged samples at room temperature. Coumarin dye correlated in associated number in reference.
- C-3. Photoquenching Parameters for Commonly Used Laser Dyes, S. Speiser and N. Shakkour, *Appl. Phys. B* 38, 191 (1985), <https://doi.org/10.1007/BF00697483>
- C-4. Medium Effects on Fluorescence Quantum Yields and Lifetimes for Coumarin Laser Dyes, G. Jones II, W.R. Jackson and A.M. Halpern, *Chemical Physics Letters* 72(2), 391 (1982), [https://doi.org/10.1016/0009-2614\(80\)80314-9](https://doi.org/10.1016/0009-2614(80)80314-9)
- C-5. Laser Dye Stability. Part 5, Effect of Chemical Substituents of Bicyclic Dyes Upon Photodegradation Parameters, A.N. Fletcher and D.E. Bliss, *Appl. Phys.* 16, 289 (1978), <https://doi.org/10.1007/BF00885124>
- C-7a. The Effect of Oxygen on the Fluorescence Quantum Yields of Some Coumarin Dyes in Ethanol, R.F. Kubin and A.N. Fletcher, *Chem. Phys. Lett.* 99(1), 49 (1983), [https://doi.org/10.1016/0009-2614\(83\)80268-1](https://doi.org/10.1016/0009-2614(83)80268-1) **Note A:** Under air.
- C-7b. The Effect of Oxygen on the Fluorescence Quantum Yields of Some Coumarin Dyes in Ethanol, R.F. Kubin and A.N. Fletcher, *Chem. Phys. Lett.* 99(1), 49 (1983), [https://doi.org/10.1016/0009-2614\(83\)80268-1](https://doi.org/10.1016/0009-2614(83)80268-1) **Note B:** Under argon
- C-7c. The Effect of Oxygen on the Fluorescence Quantum Yields of Some Coumarin Dyes in Ethanol, R.F. Kubin and A.N. Fletcher, *Chem. Phys. Lett.* 99(1), 49 (1983), [https://doi.org/10.1016/0009-2614\(83\)80268-1](https://doi.org/10.1016/0009-2614(83)80268-1) **Note C:** Under oxygen.

For a current list of biology, biological stain, or biochemistry references for Coumarin 460 from PubMed, click on the following link:

[Coumarin 460 or Coumarin 1 or Coumarin 47](#)