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Rhodamine 590*

Synonym: 2-[6-(ethylamino)-3-(ethylimino)-2,7-dimethyl-3H-xanthen-9-yl]-benzoic acid, methyl ester, chloride or tetrafluoroborate or perchlorate; (Rhodamine 6G = ethyl ester; Rhodamine 590 = methyl ester; to the best of our knowledge, the two esters have equivalent performance)

Catalog No.: 05901 (chloride); 05902 (tetrafluoroborate); 05903 (perchlorate)

CAS No.: 3068-39-1 (05901)

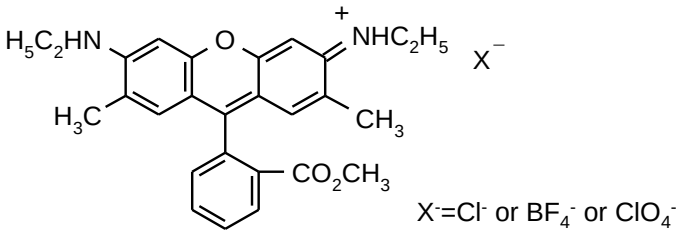
MW: 464.98 (05901); 516.34 (05902); 528.98 (05903)

Chemical Formula: $C_{27}H_{29}ClN_2O_3$ (05901); $C_{27}H_{29}BF_4N_2O_3$ (05902); $C_{27}H_{29}ClN_2O_7$ (05903)

Appearance: Bronzy red powder (05901); Red crystals (05902); Maroon crystals (05903)

Molar Absorptivity (in ethanol): 11.5×10^4 L mole^{-1} cm^{-1} (chloride form)

Structure:



Laser Dye Catalog No.	Lasing Wavelength Max. (nm)	Range (nm)	Pump Source (nm)	Solvent	Concentration (molar)	Abs λ-max	Fl λ-max
Rhodamine 590	578	565-612	FL[3]	Methanol	5×10^{-5}	530[e]	560[e]
(Available as	584	570-618	FL[3]	Ethanol	5×10^{-5}		
the Chloride,	585	562-622	FL[69]	Methanol	4×10^{-5}		
Cl, **05901**; the	586	563-625	FL[11]	Methanol	5×10^{-5}		
Perchlorate,	590		FL[63]	Methanol	8×10^{-5}		
ClO_4, **05903**;	596	577-614	FL[69]	MeOH/H_2O,1/3			
and Tetrafluoro-	598	577-625	FL[12]	MeOH/H_2O,1/1	1.3×10^{-4}		
borate, BF_4,		590-610	FL[188]	β-cyclodextrin/H_2O	2.3×10^{-4}		
05902)	600		FL[63]	4% LO/H_2O	1.2×10^{-4}		
	610	585-633	FL[12]	4% LO/H_2O	1.3×10^{-4}		
	606		FL (Triaxial) [227]	Acrylic Copolymer	1×10^{-4}		
	580		KrF(248)[44]	Ethanol	1×10^{-3}		
	590		KrF(248)[46]	p-Dioxane			
	574	563-615	XeCl(308)[114]	Methanol	1.5×10^{-3}		
	580	567-610	XeCl(308)[204]	Ethanol	2.5×10^{-3}(osc), 1.8×10^{-3}(amp)		
	582	570-616	XeCl(308)[118]	Ethanol	2.5×10^{-3}(osc), 3.8×10^{-5}(KR620)(amp)		
	583	566-610	XeCl(308)[110]	Methanol	1.5×10^{-3}		
	585	570-602	XeCl(308)[110]	Methanol	1×10^{-3}		
	591		XeCl(308)[112]	Ethanol	4×10^{-3}		
	586	570-614	XeF(351)[154]	Ethanol	5×10^{-3}		
	550		Nd:YAG(532)[54]	Methanol	3×10^{-4}		
	560	552-580	Nd:YAG(532)[57]	Methanol	2.2×10^{-4}(osc), 3.2×10^{-5}(amp)		

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Laser Dye Catalog No.	Lasing Wavelength Max. (nm)	Range (nm)	Pump Source (nm)	Solvent	Concentration (molar)	Abs λ-max	Fl λ-max
	562	546-592	Nd:YAG(532)[55]	Methanol			
	563	550-590	Nd:YAG(532)[58]	Methanol			
	563	552-584	Nd:YAG(532)[53]	Methanol	120.6mg/l(osc), 51mg/l(amp)		
	564		Nd:YAG(532)[5]	Ethanol	3.7×10^{-4}(osc), 3×10^{-5}(amp)		
	566	556-580	Nd:YAG(532)[110]	Methanol	1×10^{-4}		
	566	559-576	Nd:YAG(532)[239]	Ethanol	1.9×10^{-4}		
	574	563-597	Nd:YAG(355)[110]	Methanol	6×10^{-4}		
	574	563-597	Nd:YAG(355)[239]	Ethanol	8.4×10^{-4}		
	575	556-620	Nd:YAG(d,m-I,QS)[168]	EG			
	575	565-600	Nd:YAG(532)[116]	Ethanol	5×10^{-4}		
	577	567-602	Nd:YAG(355)[109]	Ethanol	2.5×10^{-3}		
	577		Nd:YAG(532,25kHz, 40 watts) [229]	MeOH/H_2O),1/1	1.75×10^{-4}		
	578	566-600	Nd:YAG(532)[110]	Methanol	1×10^{-4}(R590)		
					1.3×10^{-5}(R610)		
	567	557-590	N_2(337)[122]		+C540A		
	576	555-618	N_2(337)[73]	Ethanol			
	579	568-605	N_2(337)[5]	Ethanol	5×10^{-3}		
	585	571-616	N_2(337)[114]	Ethanol	4.2×10^{-3}		
	596	569-635	N_2(337)[90]	Ethanol	5.3×10^{-3}		
	596	575-625	N_2(337)[183]	Methanol	55mg/20ml		
	590	570-650	Ar(458,514)[17]	EG	2×10^{-3}		
	593	573-640	Ar(Blue/Green)[123]	LO/EG,3/1 + COT			
	598	566-640	Ar(458-514)[206]	EG/MeOH,9.5/0.5	2.1×10^{-3}**		
	600	567-657	Ar(cw)[14]	EG			
	602	560-654	Kr(Blue/Green)[68]	MeOH/EG	80% pump absorption		
	567	555-584	Cu(511)[153]	Methanol	4×10^{-4}		
	572	599-606	Cu(511)[153]	Methanol	9.6×10^{-4}		
	572	-564-600-	Cu(511,578)[28]	Ethanol	1×10^{-3}		
	585	563-607	Cu(511)[175]	Methanol	4×10^{-4}		
	590	575-614	Cu(511)[153]	Methanol	8.8×10^{-4}(R590)+ 2.1×10^{-4}(KR620)		

** This represents a maximum value. Concentration should be adjusted to 80-85% absorption of the pump light.

E = Ethanol; EG = Ethylene Glycol; MeOH = Methanol; LO = Ammonyx LO; COT = Cyclooctatetraene

* Equivalent species may be provided or substituted

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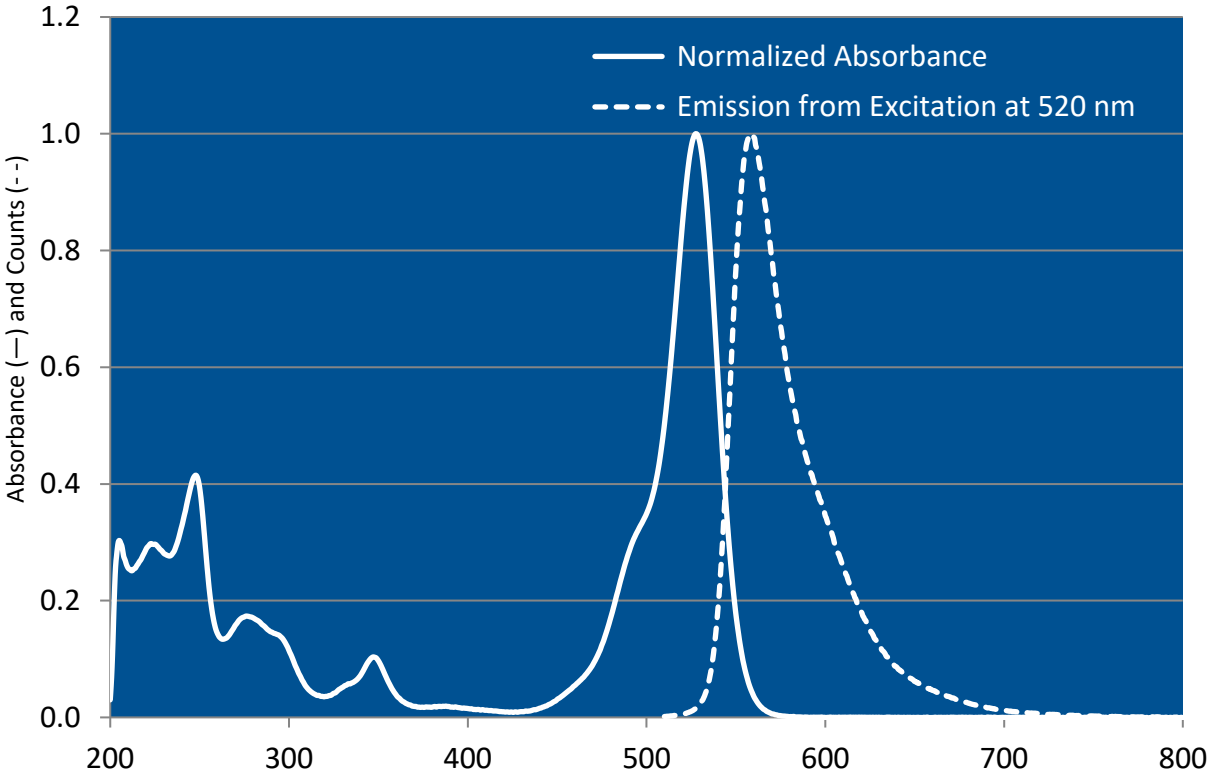
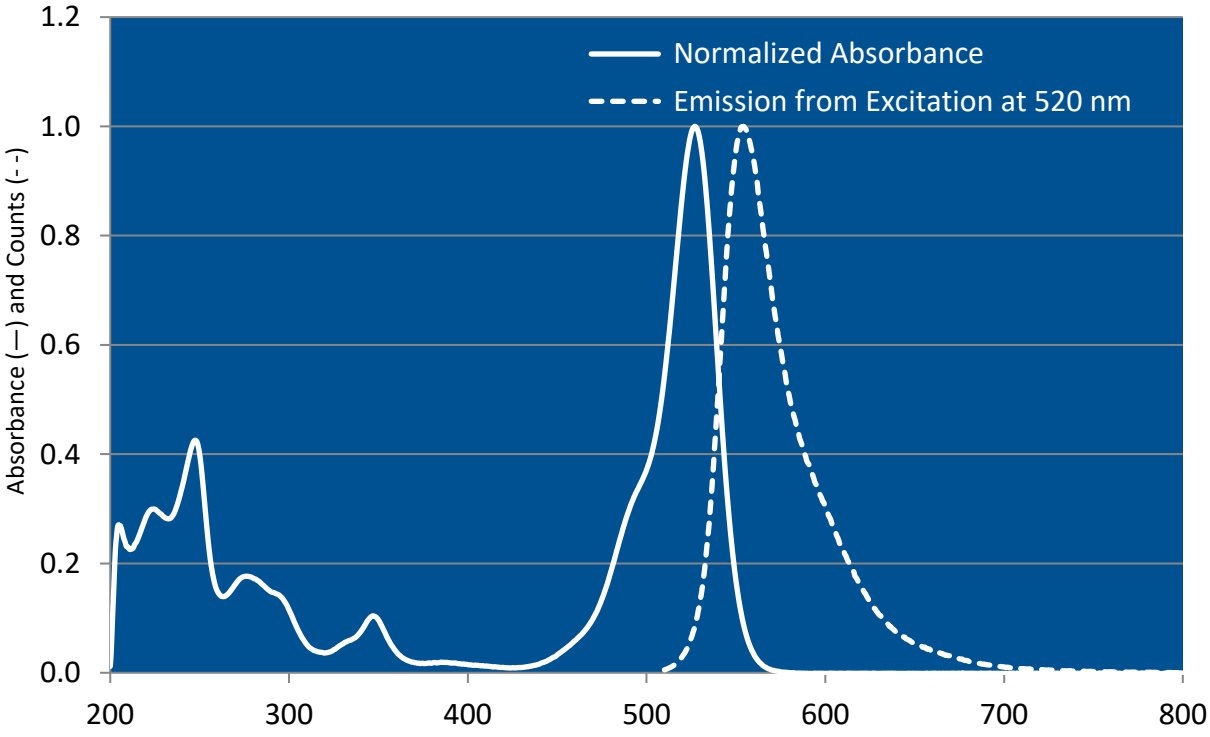
Rhodamine 590 Chloride in Methanol



Rhodamine 590 Tetrafluoroborate in Methanol



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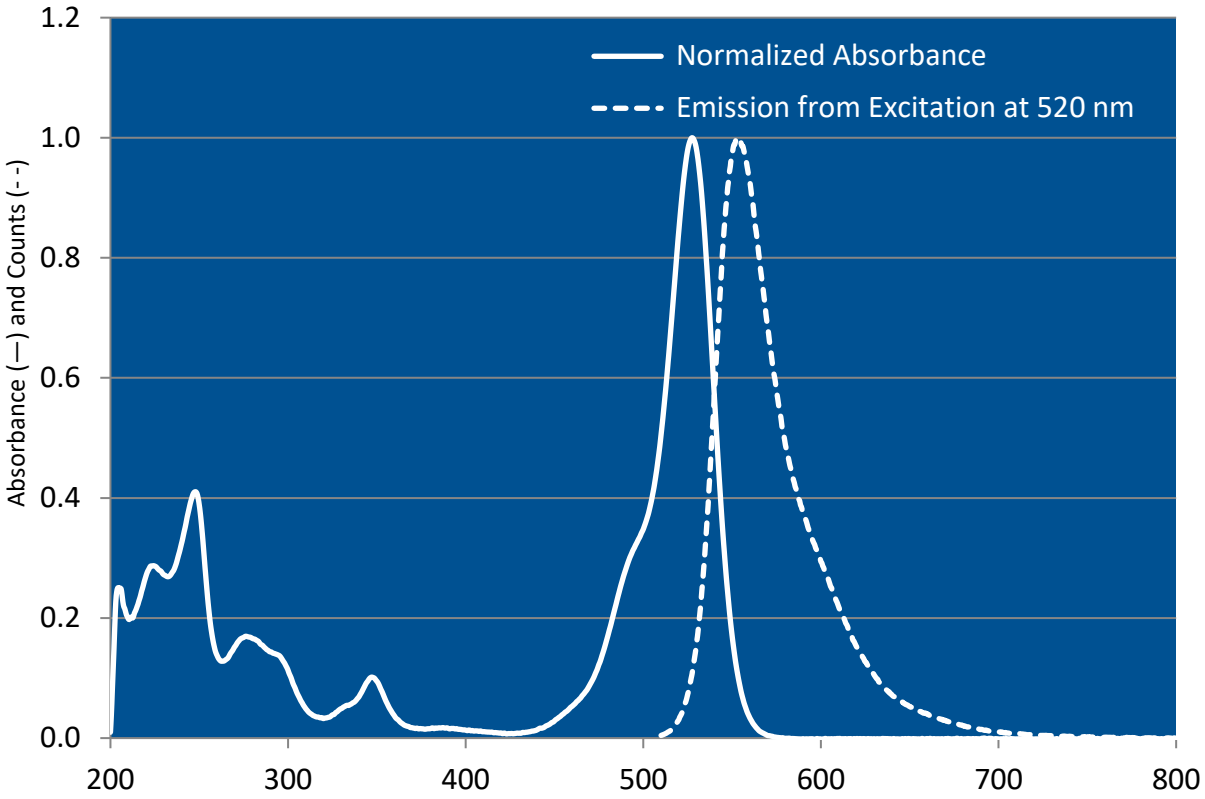
Rhodamine 590 Perchlorate in Methanol



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
	590		Ethanol	5.5	C-3
		0.99	Ethanol	5.3	R-2
			Ethanol	4.5	R-2(18)
	See reference for the number reported in ( ). These numbers represent the references sited within the R-1 reference.				
			Ethanol	4.3	R-2(19)
			Ethanol	3.8	R-2(20)
		0.95	Ethanol		R-2(24)
		0.9	Ethanol		R-2(12)
	558	0.95	Ethanol		R-8
			Fluorescent quantum yield relative to QSH (ff 0.55) at 25 degrees C; 1.05×10^{-7}M		
		0.89	Methanol	4.9	R-2
		0.9	Methanol		R-2(26)
			Methanol	4.5	R-2(18)
			Methanol	4	R-2(20)
		0.95	Methanol		CD-1

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For a current list of biology, biological stain, or biochemistry references for Rhodamine 590 from PubMed, click on the following link:

Rhodamine 590 or Rhodamine 6G