EXTINCTION COEFFICIENTS AND FLUORESCENCE DATA

Calculate extinction coefficient of an oligo by either summing up the extinction coefficients of the individual bases times their number of occurrences. Or use a formula that takes into account nearest neighbor effects. An algorithm for this calculation can be found on the web. Just type in the sequence and the program will calculate the concentration of a λ A260/ml solution.

Cat.No.	Nucleoside	E260	λmax- 1	Emax-1	λmax- 2	Emax- 2	Notes
		(L/mol.cm)	(nm)	(L/mol.cm)	(nm)	(L/mol.cm)	
10- 1001	7-deaza-dA	9,400	270	11,300			
10- 1003	N6-Me-dA	15,200	266	16,900			
10- 1006	Etheno-dA	4,700	295	3,400	274	5,900	
10- 1007	8-Br-dA	14,800	266	16,400			
10- 1008	8-Oxo-dA	11,100	268	12,200			
10- 1014	pdC	5,100	295	7,700	234	14,700	
10- 1017	Pyrrolo-dC	2,410	339	2,360	229	17,500	
10- 1021	7-deaza-dG	12,600	259	12,600			
10- 1027	8-Br-dG	11,300	253	12,100			
10- 1028	8-oxo-dG	5,900	294	5,200	250	6,700	
10- 1031	5'-OMe-dT	8,300	266	9,000			
10- 1035	Carboxy-dT	14,700	297	16,100	261	14,700	
10- 1036	2-thio-dT	10,000	278	17,500	220	14,800	
10- 1040	dI (Inosine)	7,500	249	12,500			
10- 1041	dNebularine	7,000	262	7,100			
10- 1043	3-Nitropyrrole	7,700	283	8,800			
10- 1044	5-Nitroindole	16,000	328	8,500	265	17,000	
10- 1045	4- Methylindole	7,200	265	7,900			
10- 1046	2- Aminopurine	1,000	303	6,800	243	5,700	
10- 1047	dP	2,900	294	6,700	231	7,400	
10- 1048	dK	7,700	279	10,700			
10- 1050	dU	10,000	262	10,000			
10- 1052	4-thio-dU	3,600	330	30,400			
10- 1053	5-OH-dU	4,900	280	7,800			
10- 1054	pdU	3,500	291	11,300	231	11,400	
10- 1055	d-pseudoU	7,600	262	7,700			
10- 1056	Fluorescein- dT	7,100					
10- 1060	5-Me-dC	7,800	277	9,000			
10- 1061	5-Me-dZ	1,800	314	4,800	218	8,600	
10- 1062	hmdC	8,700					
10- 1063	5-OH-dC	3,400	292	6,300	220	13,300	
10- 1065	5-Me-isodC	6,300	260	6,300			
10- 1067	5-Me-isodC	6,300	260	6,300			
10- 1076	7-deaza-dX	8,800	284	6,500	252	10,400	
10- 1077	iso-dG	4,600	292	11,000			
10- 1078	iso-dG	4,600	292	11,000			
10- 1080	5-Br-dC	3,100	287	6,000			
10- 1081	5-I-dC	3,300	293	5,700			
10- 1085	2,6- diaminoPurine	8,500	278	10,200	255	9,300	
10- 1090	5-Br-dU	5,100	278	9,700			
10- 1091	5-I-dU	3,700	287	7,700			
10- 1095	2,4-difluoro- toluene	1,800	266	2,300			
10- 1097*	AP-dC	10,900	362	10,500			
10- 1514	Formyl-dC	11,300					
10- 1530	dihydro-dT	<100	210	6,300			
10- 1539	DBCO-dT	18,800					
10- 1550	dihydro-dU	<100	210	6,300			
10- 1554	5-Ethynyl-dU	3,800	287	10,300			
10- 1934	5- Formylindole	9,700	298	14,050			
10-1941	DBCO-TEG	8,000					
10- 3055	PseudoUridine	8,100					

Note: Biotin and Cholesterol have no absorbance at 260nm.

*With an extinction coefficient of approximately 10,500 M-1 and a quantum yield of fluorescence of 0.2, AP-dC is 2-3 times as bright as our popular Pyrrolo-dC analog. In addition, AP-dC exhibits a Stokes' shift greater than 100 nm. As with most fluorescent base analogs, it is substantially quenched upon forming a duplex. The quantum yield drops to 0.1 while gaining significant structure in the emission spectrum (Figure 4), making it an ideal probe of DNA structure.

FLUORESCENCE DATA

Dye	E 260 nm	E λ max	Excitation max	Emission max	QY	Notes
	($M^{-1}\cdot cm^{-1}$)	($M^{-1}\cdot cm^{-1}$)	(nm)	(nm)		
Acridine	39,500	9,120	421	497		
2-aminopurine	1,000	3,600	303	371		
5'-CDPI$_3$ MGB™	37,900	59,300	340			
Cy3	4,930	136,000	547	563	0.15	
Cy3.5	24,000	116,000	591	604	0.15	
Cy5	10,000	250,000	646	662	0.3	
Cy5.5	21,500	209,000	688	707	0.3	
Dabcyl-dT	29,100	32,000	476			
5'-Dabcyl	11,100	32,000	468			
Eclipse Quencher	6,600	33,300	530	N/A	0	
Etheno-dA	4,800	5,800	276	405	0.035	
Ferrocene-dT	14,200					
6-FAM	20,900	75,000	495	521	0.9	
Fluorescein-dT	38,800	75,000	494	522	0.9	
HEX	31,580	96,000	537	556	0.7	
Methylene Blue	10,300	81,000	665			
NBD	3,700	19,500	485	535	0.1	
Psoralen	16,500	11,000	301			
Pyrrolo-dC	4,000	3,700	345	470	0.07/0.02	QY 0.07 single-stranded; 0.02 ds, deprotected in ammonia 55°C ON
Pyrene-dU	18,500	42,200	402			
Redmond Red	12,100	74,000 (pH 9.1) 52,300 (pH 7.1)	579	595	0.84	
TAMRA	32,300	89,000	556	580	0.7	
TET	16,255	86,000	519	539	0.9	
Yakima Yellow	23,700	83,800	530.5	549	0.96	

PHYSICAL PROPERTIES OF BLACK HOLE QUENCHERS

Quencher	λmax (nm)	E260 (L/mol.cm)	Emax (L/mol.cm)
BHQ-0	493	7,700	34,000
BHQ-1	534	8,000	34,000
BHQ-2	579	8,000	38,000
BHQ-3	672	13,000	42,700