TABLE 14.1.

Operating parameters of dye lasers

Pump source	Output power (peak value)	Pulse duration (ns)	Repetition rate (Hz)	Approximate minimum bandwidth (MHz)	Wavelength range (nm)
Flashlamp	20 - 50 kW	300 - 500	10 - 100	4	350 - 850
Ruby or neodymium laser	0·5 - 5·0 MW	5 - 20	≈ 1	50	350 - 1200
Molecular nitrogen laser	2·0 - 200 kW	2 - 8	30 - 500	500	350 - 1200
Argon ion laser	50 - 500 mW	—	C.W.	0·5	400 - 700

TABLE 14.2

Wavelength range of ultraviolet and infrared radiation generated by dye laser sum and difference frequency mixing in non-linear media

Non-linear optical material	Wavelength range	Input power (peak)	Conversion efficiency (per cent)
Ammonium dihydrogen phosphate (ADP)	280 - 290 nm	20 MW	10
Cooled ADP	250 - 325 nm	60 kW	10
Lithium formate monohydrate	230 - 300 nm	50 kW	2
Proustite (Ag_3AsS_3)	3·2 - 5·6 μm	900 kW	2
Lithium iodate	4·1 - 5·2 μm	4 MW	10^{-2}
Proustite	10·1 - 12·7 μm	290 kW	10^{-6}
Sodium/potassium vapour	2·21 - 23·4 μm	20 kW	10^{-5}

tuning range of dye lasers are still rather difficult.

When shorter pulse lengths are necessary these can be generated by mode locking a dye laser as discussed in section 13.6. The very wide gain bandwidth of dye lasers should theoretically permit the generation of sub-picosecond pulses, but dispersion in the cavity optics and other problems have so far imposed a lower limit of about 1·5 ps on the attain-