Table 1 Commonly Used Radiometric, Photometric and Photon Quantities

Radiometric			Photometric			Photon		
Quantity	Usual Symbol	Units	Quantity	Usual Symbol	Units	Quantity	Usual Symbol	Units
Radiant Energy	Q_e	J	Luminous Energy	Q_v	lm s	Photon Energy	N_p	*
Radiant Power or Flux	ϕ_e	W	Luminous Flux	ϕ_v	lm	Photon Flux	$\Phi_p = \frac{dN_p}{dt}$	s^{-1}
Radiant Exitance or Emittance	M_e	$W\ m^{-2}$	Luminous Exitance or Emittance	M_v	$lm\ m^{-2}$	Photon Exitance	M_p	$s^{-1}\ m^{-2}$
Irradiance	E_e	$W\ m^{-2}$	Illuminance	E_v	lx	Photon Irradiance	E_p	$s^{-1}\ m^{-2}$
Radiant Intensity	I_e	$W\ sr^{-1}$	Luminous Intensity	I_v	cd	Photon Intensity	I_p	$s^{-1}\ sr^{-1}$
Radiance	L_e	$W\ sr^{-1}\ m^{-2}$	Luminance	L_v	$cd\ m^{-2}$	Photon Radiance	L_p	$s^{-1}\ sr^{-1}\ m^{-2}$

* **Photon quantities are expressed in number of photons followed by the units, eg. photon flux (number of photons) s^{-1}. The unit for photon energy is number of photons.**

Symbols Key:

J: joule
W: watts
m: meter
sr: steradian
lm: lumen
s: second
cd: candela
lx: lux, lumen m^{-2}

Table 3 Spectral Parameter Conversion Factors

	Wavelength	Wavenumber*	Frequency	Photon Energy**
Symbol (Units)	λ (nm)	υ (cm^{-1})	ν (Hz)	E_p (eV)
Conversion Factors	λ	$10^7/\lambda$	$3 \times 10^{17}/\lambda$	$1{,}240/\lambda$
	$10^7/\upsilon$	υ	$3 \times 10^{10}\upsilon$	$1.24 \times 10^{-4}\upsilon$
	$3 \times 10^{17}/\nu$	$3.33 \times 10^{-11}\nu$	ν	$4.1 \times 10^{-15}\nu$
	$1{,}240/E_p$	$8{,}056 \times E_p$	$2.42 \times 10^{14}E_p$	E_p
Conversion Examples	200	5×10^4	1.5×10^{15}	6.20
	500	2×10^4	6×10^{14}	2.48
	1000	10^4	3×10^{14}	1.24

When you use this table, remember that applicable wavelength units are nm, wavenumber units are cm^{-1}, etc.

* **The S.I. unit is the m^{-1}. Most users, primarily individuals working in infrared analysis, adhere to the cm^{-1}.**

** **Photon energy is usually expressed in electron volts to relate to chemical bond strengths.The units are also more convenient than photon energy expressed in joules as the energy of a 500 nm photon is 3.98×10^{-19} J = 2.48 eV**