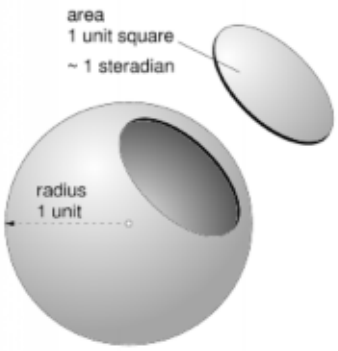
Lecture 4
Spectrochemical Measurement

Expressions of optical intensity

Geometric factors



Radiometric system

Example: radiant power is incident on the detector

Photometric system

Is a relative system based on apparent intensity of a source as viewed by a human eye.

Lumen (lm) and candela (cd) – a standard candle

Luminous intensity from a candela is 1/60 of the LI of a blackbody radiator of 1cm2 area at 2042 K. A source of 1cd emits 1 lm per steradian.

Radiometric and photometric systems: a comparison

Radiometric quantity	Photometric quantity	Definition of a photometric quantity
Radiant energy J	Luminous energy lm s	Portion of radiant energy in visible region
Radiant power W	Luminous power lm	Luminous power per init time
Radiant intensity W sr-1	Luminous intensity lm sr-1	Luminous power per unit of solid angle
Radiant emittance W cm-2	Luminous emittance lm cm-2	Luminous power per unit source area
Irradiance W cm-2	Illuminance lm cm-2	Luminous power per unit of area incident on a surface
Radiance W sr-1 cm-2	Luminance (brightness) lm cm-2 sr-1	Luminous power per unit solid angle per init projected area

Conversion

Spectral luminous efficiency