doi:10.1351/goldbook.P04637

photon irradiance, E_p

Number of photons (quanta of radiation, N_p) per time interval (photon flux), q_p, incident from all upward directions on a small element of surface containing the point under consideration divided by the area of the element. SI unit is $m^{-2}\ s^{-1}$. Equivalent definition: Integral, taken over the hemisphere visible from the given point, of the expression $L_p \cos\theta\ d\Omega$ the photon radiance at the given point in the various directions of the incident beam of solid angle Ω and θ the angle between any of these beams and the normal to the surface at the given point.

Notes:

1. Mathematical definition: $E_p = dq_p / dS$. If the photon flux is constant over the surface considered, $E_p = q_p / S$. Equivalent definition: $E_p = \int_{2\pi} L_p \cos\theta d\Omega$.
2. This term refers to a beam not scattered or reflected by the target or its surroundings. For a beam incident from all directions photon fluence rate ($E_{p,o}$) is an equivalent term.
3. This quantity can be used on a chemical amount basis by dividing E_p by the Avogadro constant, the symbol then being $E_{n,p}$, the name 'photon irradiance, amount basis', SI unit is $mol\ m^{-2}\ s^{-1}$; common unit is $einstein\ m^{-2}\ s^{-1}$.

Source:

PAC, 2007, *79*, 293 *(Glossary of terms used in photochemistry, 3rd edition (IUPAC Recommendations 2006))* on page 396

