Photoelectric Effect, Bremsstrahlung, and Compton Effect Formulas Should Contain Rotational and Vibrational Energies STEWART BREKKE, Northeastern Illinois University (former grad student) — The kinetic energy element in the Photoelectric Effect, Bremsstrahlung and Compton Effect formulas should also include besides the linear kinetic energy element rotational (spin) and vibrational kinetic energy elements. In the photoelectric effect the formula should be $[h\nu = 1/2mv^2 + 1/2I\omega_r^2 + (n + 1/2)\hbar\omega_v + \phi]$ where ω_r is the rotational angular velocity and ω_v is the vibrational angular frequency. Similarly, in Bremsstrahlung the kinetic energy lost to photon creation at total braking shoudl be $[1/2mv^2 + 1/2I\omega_r^2 + (n + 1/2)\hbar\omega_v = eV = h\nu_{max}]$. The resulting kinetic energy of a recoil particle in the Compton Effect should be $[1/2mv^2 + 1/2I\omega_r^2 + (n + 1/2)\hbar\omega_v = (h\nu)\Delta\lambda/(\lambda + \Delta\lambda)]$. Also, in pair production and annhiliation the kinetic energies of the annhiliated pair and created pair should include the spin and vibrational energies.

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