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Photoelectric Effect Formula Must Include Rotational and Vibrational as well as Linear Kinetic Energies STEWART BREKKE, Chicago Public schools (retired) — The incident photon energy in the Photoelectric Effect has traditionally thought to manifest itself only in the work function and the linear kinetic energy of the ejected electron. However, the ejected electron is also spinning and vibrating. Therefore, the incident photon energy must also manifest itself in the spin and vibrational kinetic energy of the ejected electron. It is thought that the electron loses its initial linear kinetic energy through collisions with other electrons in the material. Also, the spin and vibration could be lost in collisions with other electrons in the material. The resulting equation for the Photoelectric Effect must then be $hf = 1/2mv^2 + 1/2I\omega^2 + 1/2kx_0^2 + \phi$ where $1/2I\omega^2$ is the rotational kinetic energy of the electron,k is a constant of vibration and x_0 is the amplitude of vibration of the electron. The inverse photoelectric effect must also include the spin and vibration energies going into creation of the resulting photon.

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