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Photoelectric Effect Formula Must Include Vibrational and Rotational as Well as Linear Kinetic Energies of Ejected Electron STEWART BREKKE, Northeastern Illinois University (former grad student) — All matter has no motion, is moving linearly, vibrating and/or rotating singly or in some combination. Curvilinear motion is linear motion influenced by an external force field. Einstein proposed that through collisions in the material all linear kinetic energy is lost and only the energy from the impacting photon affects the linear kinetic energy of the ejected electron. However, the electron is also rotating and vibrating in the material and these kinetic energies may also be lost through collisions with other electrons in the material. Therefore, the ejected electron may also have rotational and vibrational motion as well as linear motion resulting from the energy of the incident photon. The current values of the work functions may have to be reevaluated slightly therefore. The formula for the Photoelectric Effect must be changed to include the possibility of the total energy of incident photon also creating vibrational and rotational motion as well as linear motion in the ejected electron. Therefore the formula must be $hf = (1/2mv^2 + 1/2I\omega^2 + 1/2kx^2)_{max} + \phi$.

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