Photoelectric effect problem

Radiation of a certain wavelength causes electrons with a maximum kinetic energy of 0.68 eV to be ejected from a metal whose work function is 2.75 eV. What will be the maximum kinetic energy (in eV) with which this same radiation ejects electrons from another metal whose work function is 2.17 eV?

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The unknown is the radiation frequency (or actually the photon energy). First we need to solve for that energy. Always write down the equation first to be sure that you can see the relationships

$$h\nu = \Phi + \frac{1}{2}mv^2$$

Photon energy = work function + kinetic energy

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$$h\nu = 2.75 + 0.68 = 3.43 \ eV$$

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Now to the second part. Here we need to solve for the kinetic energy knowing the work function and photon energy.

$$\frac{1}{2}mv^2 = h\nu - \Phi$$

Kinetic energy = photon energy - work function

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$$\frac{1}{2}mv^2 = 3.43 - 2.17 = 1.26 \text{ eV}$$

Kinetic energy = photon energy - work function