Answer on the question #49038, Chemistry, Physical Chemistry

Question:

The two electrons having kinetic energies 16eV and 49eV respectively . What is the ratio of their wave lengths ?

Solution:

The relation between energy and wavelength of the electron is:

$$\lambda = \frac{h}{\sqrt{2mE}}$$

Then, the ratio of electron wavelength is:

$$\frac{\lambda_1}{\lambda_2} = \frac{h}{\sqrt{2mE_1}} * \frac{\sqrt{2mE_2}}{h} = \frac{\sqrt{E_2}}{\sqrt{E_1}} = \frac{\sqrt{49}}{\sqrt{16}} = \frac{7}{4} = 1.75$$

Answer: 1.75