Answer on Question #78635, Physics / Atomic and Nuclear Physics

The de Broglie wavelength of an electron in the first Bohr orbit is

Solution:

According to the Bohr model of the atom (https://en.wikipedia.org/wiki/Bohr_model) the angular momentum of the orbiting electron is quantised such that

$$mvr = \frac{nh}{2\pi}.$$

From this condition the de Broglie wavelength of an electron in the first Bohr orbit $(n = 1)$ is

$$\lambda = \frac{h}{mv} = 2\pi r = 0.332 nm.$$

Note, here $r = 0.0529 nm$ being the Bohr radius.

Answer: $\lambda = 0.332 nm$.

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