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Anomalous Ultraviolet Lines of Hydrogen - B

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These lines appear when the electrons fall to the nuclei and the potential energy is released.

Potential energy:

$$E = m_e g_{ep} nR \qquad \text{and} \qquad R = \frac{137 x_e}{2\pi} \quad \text{-- Bohr radius}$$

$$m_e = 9.11 \times 10^{-31} kg$$

$$g_{ep} = \sqrt{g_e g_p} \qquad \text{and} \qquad g = \frac{kf^3}{w}$$

Field accelerations:

Electron -- $g_e = 1.327 \times 10^{18}$

Proton -- $g_p = 7.755 \times 10^{27}$

Experimental values

$$E = n13.6eV \qquad \text{for} \qquad \text{n = 2,3,7,9}$$

$$E = n13.6 - 21.21eV \qquad \text{for} \qquad \text{n = 4,6,8}$$

n = 2 -- $E = 2 \times 13.6 = 27.2eV$

n = 3 -- $E = 3 \times 13.6 = 40.8eV$

$$21.21\text{eV} \quad \Leftrightarrow \quad n = \frac{3}{4}$$

We don't know the explanation for the second group of energies but the value of 21.21eV is for $n = \frac{3}{4}$