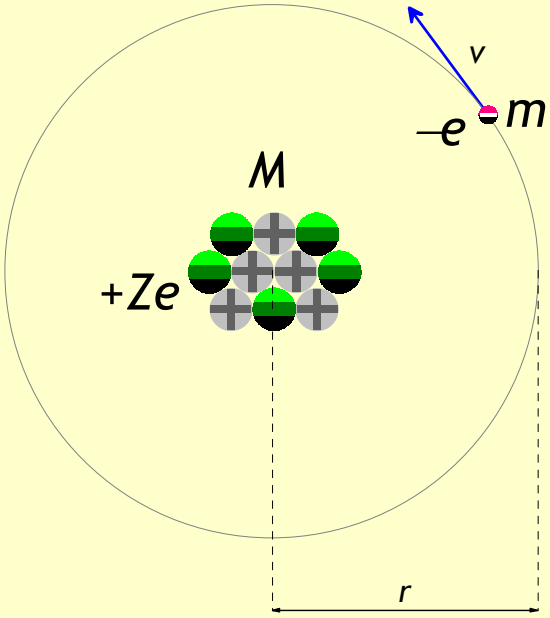
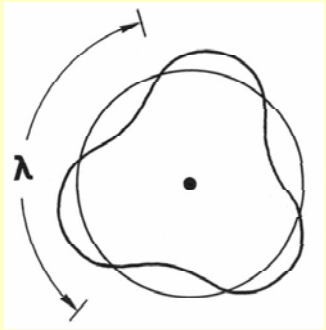
Bohrs atommodell, sammanfattning



Reducerad massa: $\mu = \dfrac{mM}{m+M}$

Kvantisering: stationära banor

$$n \cdot \lambda_{\text{de Broglie}} = 2\pi r$$



$$r = \frac{\varepsilon_0 h^2}{\pi \mu e^2} \frac{n^2}{Z}$$

Bohrradien

väte: $r = \left(0{,}53 \cdot 10^{-10}\ \text{m}\right) \cdot n^2$

totalenergin:

$$E = -\frac{Ze^2}{8\pi\varepsilon_0}\frac{1}{r} = -\frac{e^4 \mu}{8\varepsilon_0^2 h^2}\frac{Z^2}{n^2}$$

väte: $E = -\dfrac{(13{,}6\ \text{eV})}{n^2}$

Bohrs atommodell, sammanfattning (forts.)

Rydbergs formel (för väte och vätelika joner):

$$\sigma \equiv \frac{1}{\lambda_{vak}} = R_M Z^2 \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

där $R_M = \dfrac{R_\infty}{1 + \dfrac{m}{M}}$

Det uppstår isotopskift (λ-skillnader) pga. olika kärnmassa M.