

Unified Force Between Two Electrons

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$$F_{ee} = \frac{chk}{x^4} \quad \text{and} \quad x_e = 2.426 \times 10^{-12} m$$

$$F_{ee} = 1.12 \times 10^{-12} N$$

Electric force:

$$F_e = \frac{q_e^2}{4\pi\epsilon_0 R^2} = \frac{chk}{x^4} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad R = 1.435 \times 10^{-8} m$$

Rydberg constant:

$$R_H = 1.0968 \times 10^7 m^{-1}$$

Rydberg wavelength:

$$\lambda_H = \frac{1}{R_H} = 9.1127 \times 10^{-8} m$$

$$\lambda_H = 4\pi 137 R_e \quad \text{and} \quad R_e = 5.3 \times 10^{-11} m \quad (\text{Bohr radius})$$

$$\lambda_H = 2\pi R$$

$$\lambda_H = \frac{8\epsilon_0^2 h^3 c}{m_e q_e^4}$$

The Rydberg wavelength is that of the potential energy of a electron in the lower orbit.

$$\lambda_H = 2x_e 137^2$$