

Problema205: Calcula a lonxitude de onda e a frecuencia da radiación emitida na transición dun electrón do átomo de hidróxeno entre os niveis  $n = 4$  e  $n = 2$ .  $R_H = 1,097 \cdot 10^7 \text{ m}^{-1}$ .

Fórmula de Rydberg

$$\frac{1}{\lambda} = R_H \left[ \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right) \right]$$

$$\frac{1}{\lambda} = R_H \left[ \left( \frac{1}{2^2} - \frac{1}{4^2} \right) \right] = 1,097 \cdot 10^7 \text{ m}^{-1} \left[ \left( \frac{1}{4} - \frac{1}{16} \right) \right] = 1,097 \cdot 10^7 \text{ m}^{-1} \cdot \frac{3}{16} = 2,057 \cdot 10^6 \text{ m}^{-1}$$

$$\lambda = \frac{1}{2,057 \cdot 10^6 \text{ m}^{-1}} = \underline{4,86 \cdot 10^{-7} \text{ m} = 486 \text{ nm}}$$

$$c = \lambda \cdot f$$

$$f = \frac{c}{\lambda} = \frac{3 \cdot 10^8 \text{ m/s}}{4,86 \cdot 10^{-7} \text{ m}} = \underline{6,17 \cdot 10^{14} \text{ s}^{-1} = 6,17 \cdot 10^{14} \text{ Hz}}$$