P #C

Ch 28 - Worksheet

a) For Balmer, $n = 3, 4, 5 \ldots$

$R_H = 1.097 \times 10^7 \ m^{-1}$

Example for 1st line:

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{2^2} - \frac{1}{n^2}\right)$$

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{2^2} - \frac{1}{3^2}\right)$$

$$\lambda_1 = 656.3 \text{ nm}$$

b) For Lyman, $n = 2, 3, 4 \ldots$

$R_H = 1.097 \times 10^7 \ m^{-1}$

Example for 1st line:

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{1^2} - \frac{1}{n^2}\right)$$

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{1^2} - \frac{1}{2^2}\right)$$

$$\lambda_1 = 121.5 \text{ nm}$$

c) For Paschen, $n = 4, 5, 6 \ldots$

$R_H = 1.097 \times 10^7 \ m^{-1}$

Example for 1st line:

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{3^2} - \frac{1}{n^2}\right)$$

$$\frac{1}{\lambda} = R_H \cdot \left(\frac{1}{3^2} - \frac{1}{4^2}\right)$$

$$\lambda_1 = 1875 \text{ nm}$$