8-4 G.36

$$\nu = \frac{me^4}{64\pi^3\epsilon_0^2\hbar^3}\left(\frac{1}{n_2^2}-\frac{1}{n_1^2}\right) = R_\infty\left(\frac{1}{n_2^2}-\frac{1}{n_1^2}\right)$$

$$E_n = -\frac{me^4}{32\pi^2\epsilon_0^2\hbar^2}\frac{Z^2}{n^2} =$$

$\Rightarrow$ Energy $\propto \left(\frac{Z}{n}\right)^2$

if $Z_{eff} = Z-1$

so ν becomes

$$\cancel{\nu = cR_\infty}$$

$$\nu = cR_\infty\left(\frac{Z^2}{n_2^2}-\frac{Z^2}{n_1^2}\right)$$

let $Z = Z_{eff} = Z-1$

$$\nu = cR_\infty(Z-1)^2\left(\frac{1}{n_2^2}-\frac{1}{n_1^2}\right)$$

~~Let $n_2 = \infty$~~ $n_1 =$

$K_\alpha \Rightarrow \begin{cases} n_2 = 1 \\ n_1 = 2 \end{cases}$

so

$$\nu = cR_\infty(Z-1)^2\left(\frac{1}{1^2}-\frac{1}{2^2}\right)$$

$$= cR_\infty(Z-1)^2\left(3/4\right)$$