

$$4D_{5/2} \rightarrow 3p_{1/2} \quad \begin{matrix} \Delta l & \Delta j \\ -1 & -2 \end{matrix} \quad \text{FORBIDDEN}$$

$$4D_{3/2} \rightarrow 3p_{1/2} \quad \begin{matrix} \Delta l & \Delta j \\ -1 & -1 \end{matrix} \quad \text{ALLOWED}$$

$$4D_{3/2} \rightarrow 3s_{1/2} \quad \begin{matrix} \Delta l & \Delta j \\ -2 & -1 \end{matrix} \quad \text{FORBIDDEN}$$

7-56) a)

$$E_I = -13.6 \text{ eV} (2-1)^2 = -13.6 \text{ eV} (74-1)^2 = -72.5 \text{ keV}$$

b) $E_I(\text{exp}) = -69.5 \text{ keV}$

$$E_I(\text{exp}) = -13.6 \text{ eV} (2-\epsilon)^2$$

$$(2-\epsilon) = \left(\frac{E_I(\text{exp})}{-13.6 \text{ eV}} \right)^{1/2}$$

$$\epsilon = 2 - \left(\frac{69.5 \text{ keV}}{13.6 \text{ eV}} \right)^{1/2} = 74 - 71.5 = \underline{\underline{2.5}}$$