$z_{tot} = \frac{2}{3} \frac{1}{\omega_{Ag}} \mu_B \left(\frac{dB}{dz}\right) \cdot t$ $= 1.79 \times 10^{-25}\,kg$

$$\left(\frac{dB}{dz}\right) = \frac{2}{3} \frac{\omega_{Ag}}{z_{tot}} \cdot \frac{1}{\mu_B} \cdot \frac{1}{t^2}$$

$$= \frac{2}{3} \cdot 1.79 \cdot 10^{-25}\,kg \cdot 5 \cdot 10^{-4}\,m \cdot \frac{1}{9.27 \cdot 10^{-24}\,J/T} \cdot (250\,s^{-1})^2$$

$$= 0.805\ T/m$$

7-44) a) CARBON $Z = 6$ $(1s)^2 (2s)^2 (2p)^2$

b) OXYGEN $Z = 8$ $(1s)^2 (2s)^2 (2p)^4$

c) ARGON $Z = 18$ $(1s)^2 (2s)^2 (2p)^6 (3s)^2 (3p)^6$

7-48) $E_n = -\frac{Z_{eff}^2 \cdot E_1}{n^2}$

$$Z_{eff} = n \sqrt{\frac{-E_n}{E_1}} = 3 \sqrt{\frac{5.14\,eV}{13.6\,eV}} = 1.84$$

7-55) $\Delta l = \pm 1$ $\Delta j = \pm 1, 0$

	Δl	Δj	
$4S_{1/2} \rightarrow 3S_{1/2}$	0	0	FORBIDDEN
$4S_{1/2} \rightarrow 3P_{3/2}$	1	1	ALLOWED
$4P_{3/2} \rightarrow 3S_{1/2}$	−1	−1	ALLOWED