

# Matter & Atomic Structure Supplemental Homework

$$\begin{array}{r}
 1. \quad {}^{24}\text{Mg}: 0.7870 (23.985 \text{amu}) = 18.8762 \\
 {}^{25}\text{Mg}: 0.1013 (24.986 \text{amu}) = 2.5311 \\
 {}^{26}\text{Mg}: + 0.1117 (25.983 \text{amu}) = + 2.9023 \\
 \hline
 24.3096
 \end{array}$$

$$\Downarrow$$

$$\boxed{24.31 \text{amu}}$$

$$\begin{array}{r}
 2. \quad {}^{28}\text{Si}: 0.9221 (27.977 \text{amu}) = 25.7976 \\
 {}^{29}\text{Si}: 0.0470 (28.976 \text{amu}) = 1.3619 \\
 {}^{30}\text{Si}: 0.0309 (29.974 \text{amu}) = 0.9262 \\
 \hline
 28.0857
 \end{array}$$

$$\Downarrow$$

$$\boxed{28.09 \text{amu}}$$

$$3. \quad a) \quad \text{B} \quad \therefore \quad \boxed{{}^{11}\text{B}} > {}^{10}\text{B}$$

10.81

$$b) \quad \text{Ga} \quad \therefore \quad \boxed{{}^{69}\text{Ga}} > {}^{71}\text{Ga}$$

69.72

$$c) \quad \text{Ag} \quad \therefore \quad \boxed{{}^{107}\text{Ag}} > {}^{109}\text{Ag}$$

107.87

$$4. \quad 3.17 \times 10^{22} \text{Fatoms} \left( \frac{1.44 \times 10^{-8} \text{cm}}{1 \text{Fatom}} \right) \left( \frac{1 \text{in}}{2.54 \text{cm}} \right) \left( \frac{1 \text{ft}}{12 \text{in}} \right) \left( \frac{1 \text{mile}}{5280 \text{ft}} \right)$$

$$2.8364 \times 10^9 \text{ miles}$$

$\Downarrow$  3sf

$$\boxed{2.84 \times 10^9 \text{ miles}}$$