

REVIEW ANSWERS

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isotope	^{32}S	^{44}Ca	^{64}Zn	^{19}F	^{23}Na
atomic number	16	20	30	9	11
mass number	32	44	64	19	23
# p ⁺	16	20	30	9	11
# n ⁰	16	24	34	10	12
# e ⁻	16	20	34	10	11

→ could vary

102

$$10x + 11y = 10.81 \quad \& \quad x + y = 1$$

substitution! $x = 1 - y$

$$10(1 - y) + 11y = 10.81$$

$$10 - 10y + 11y = 10.81$$

$$-10y + 11y = 0.81$$

$$1y = 0.81$$

$$\begin{aligned} {}^{11}\text{B} &= 81\% \\ {}^{10}\text{B} &= 19\% \end{aligned}$$

more ${}^{11}\text{B}$!

114

$$(112.904 \text{ amu})(0.043) + (x \text{ amu})(0.957) = 114.818 \text{ amu}$$

$$4.854 - 4.854 + 0.957x = 114.818 - 4.854$$

other %:

$$\begin{array}{r} 100 \\ - 4.3 \\ \hline 95.7 \end{array}$$

$$\frac{0.957x}{0.957} = \frac{109.963}{0.957}$$

$$x = 114.904$$

% abundance = 95.7%

isotope mass is 114.904 amu which means ${}^{115}\text{Ir}$

115

The % abundance of ^{32}S must be very high, whereas there are multiple common isotopes for chlorine.

115

$$(0.79)(24) + (0.10)(25) + (0.11)(x) = 24.305$$

$$18.96 + 2.5 + 0.11x = 24.305$$

$$\frac{0.11x}{0.11} = \frac{2.845}{0.11}$$

$$x = \boxed{25.86 \text{ amu}}$$

125

mass #

Zirconium-90 \Rightarrow 90
 Zr-91 \Rightarrow 91
 Zr-92 \Rightarrow 92
 Zr-94 \Rightarrow 94
 Zr-96 \Rightarrow 96

126

$$\text{mass \#} - p^+ = n^0$$

$$90 - 40 = 50$$

$$91 - 40 = 51$$

$$92 - 40 = 52$$

$$94 - 40 = 54$$

$$96 - 40 = 56$$

Zr has 40 p⁺ (periodic table)

127

The # p⁺ for all isotopes is the same. Zr always has 40 p⁺.

The # of n⁰ ~~can~~ changes from one isotope to another.

128

It should be lower since the lowest mass isotope is the most common.

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$$(89.905)(0.5145) + (90.906)(0.1122) + (91.905)(0.1715) + (93.906)(0.1738) + (95.908)(0.028) = \boxed{91.223 \text{ amu}}$$