Quiz 2.1 – Isotopes, Atomic Weight, and the Periodic Table

Name: Key

Question 1

Give the number of protons, electrons, and neutrons in each atom or ion

	^{27}Al	$^{127}I^-$	$^{40}Ca^{2+}$	^{209}Po	$^{144}Nd^{5+}$	$^{31}P^{3-}$
e^-	13	54	18	84	55	18
p^+	13	53	20	84	60	15
n	14	74	20	125	84	16

Question 2

How many grams of Si would contain 0.750 *moles*?

$$\frac{0.750\ \text{mol} \mid 28.0855\ \text{g}}{1\ \text{mol}} = 21.1\ \text{g}$$

Question 3

How many moles of Al are in a 54.0 g sample?

$$\frac{54.0\ \text{g} \mid 1\ \text{mol}}{26.9815\ \text{g}} = 2.00\ \text{mol}$$

Question 4

Boron has two primary isotopes. ^{10}B has $m = 10.012937\frac{g}{mol}$ and an abundance of 19.9%, while ^{11}B has $m = 11.009305\frac{g}{mol}$ and an abundance of 80.1%

Based on these numbers, what atomic weight should be reported for boron?

$$M = \sum_i \frac{M_i \cdot \text{abundance}_i}{100\%}$$

$$M = 10.012937\ \text{g/mol} \cdot \frac{19.9\%}{100\%} + 11.009305\ \text{g/mol} \cdot \frac{80.1\%}{100\%}$$

$$M = 10.81\ \text{g/mol}$$

Question 5

Classify each of the following elements as an alkali metals alkaline earth metal, halogen, or noble gas:

Na	Cl	Be	Ar	Ca	I	K	Ne	Ba
Alkali metal	Halogen	Alkaline Earth Metal	Noble Gas	Alkaline Earth Metal	Halogen	Alkali Metal	Noble Gas	Alkaline Earth Metal