

Quiz 1A
11 points

Name KEY
Maleckar/960/Fall 2009

1. The most stable ion formed by O has a charge of -2 /
2. Ba is an element in the group of elements called the alkaline earth metals /
3. $^{180}_{74}\text{W}$ has 74 protons, 106 neutrons, and 74 electrons.
/ / /
4. Indicate if the following compounds are ionic or covalent.

SO_2
covalent
/

CuCl_2
ionic
/

Li_2O
ionic
/

5. Two samples of sodium chloride were decomposed into their constituent elements. One sample produced 6.98g of sodium and 10.8g of chlorine, and the other sample produced 11.2g of sodium and 17.3g of chlorine. Are these results consistent with the law of definite proportions? Show your work.

$$\#1 \quad \frac{10.8}{6.98} = 1.547$$

$$\#2 \quad \frac{17.3}{11.2} = 1.545$$

Yes - consistent

3 pts.

Quiz 1B
11 points

Name KEY
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Avogadro's number: 6.022×10^{23}

- The most stable ion formed by Ca has a charge of +2.
- Sm is an element in the group of elements called the lanthanides.
- Carbon-13 has 6 protons, 7 neutrons, and 6 electrons.
- The gold foil experiment performed by Rutherford _____ (circle one)
 - confirmed the plum pudding model of the atom
 - led to the discovery of the atomic nucleus
 - was the basis for Thompson's model of the atom
 - utilized the deflection of beta particles by gold foil
 - proved the law of multiple proportions
- Most of the volume of an atom is made up of its electrons.
- How many gold atoms are in 1 ounce of pure gold? 1 ounce = 28.3495g

$$(28.3495 \text{ g Au}) \left(\frac{\text{mole}}{196.97 \text{ g}} \right) \left(\frac{6.022 \times 10^{23} \text{ atoms}}{\text{mole}} \right) = 8.67 \times 10^{22} \text{ atoms}$$

3

Quiz 1D
11 points

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Avogadro's number: 6.022×10^{23}

1. The most stable ion formed by K has a charge of +1!
2. Rb is an element in the group of elements called the alkali metals!
3. Cobalt-59 has 27 protons, 32 neutrons, and 27 electrons.
4. All atoms of a given element have the same number of protons or electrons!
5. Circle the metal in the following list of elements. Mo, Si, Rn!
6. Is Al_2O_3 ionic or covalent? ionic!
7. An element has two naturally occurring isotopes. Isotope 1 has a mass of 120.9038 g/mole and a relative abundance of 57.4%. Isotope 2 has a mass of 122.9042 g/mole. What is the molecular weight of this element?

$$100 - 57.4 = 42.6$$

$$(120.9038)(.574) + (122.9042)(.426) = 121.7560 \text{ g/mole}$$

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Quiz 1E
11 points

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Avogadro's number: 6.022×10^{23}

- The most stable ion formed by N has a charge of -3!
- U is an element in the group of elements called the actinides!
- Zirconium-91 has 40 protons, 51 neutrons, and 40 electrons.
- Which pair of atoms constitutes a pair of isotopes of the same element? (circle one)
A. $^{14}_6\text{X}$ & $^{14}_7\text{X}$ B. $^{14}_6\text{X}$ & $^{12}_6\text{X}$
C. $^{17}_9\text{X}$ & $^{17}_8\text{X}$ D. $^{19}_{10}\text{X}$ & $^{19}_9\text{X}$
E. $^{20}_{10}\text{X}$ & $^{21}_{11}\text{X}$ F. none of these

5. How many atoms are in 15.0g of sodium?

$$(15.0\text{g}) \left(\frac{\text{mole}}{22.990\text{g}} \right) \left(\frac{6.022 \times 10^{23} \text{ atoms}}{\text{mole}} \right) = 3.93 \times 10^{23} \text{ atoms } 2$$

6. A compound containing only sulfur and oxygen is decomposed and found to contain 1.210g of S and 1.811g of O. Another sample of the same compound was found to contain 1.783g of S. How many grams of O would you expect it to contain?

$$\frac{1.811}{1.210} = 1.4967$$

$$\frac{x}{1.783} = 1.4967$$

$$x = 2.669 \text{ g O expected}$$

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