Quiz 4A

1. A chemical reaction that produces energy is called an (exothermic/endothermic) reaction (1 point).
2. (True/False) The SI unit of energy is the joule (1 point).
3. Answer the following questions about BaCl2 (10 points).
	1. Calculate the molar mass.

Ba: 1(137.327 g/mol) = 137.327 g/mol

Cl: 2(35.453 g/mol) = 70.906 g/mol

 + 208.233 g/mol

* 1. Calculate the percent chlorine, by mass.

$$\%Cl=\frac{m\_{Cl}}{m\_{BaCl\_{2}}}×100=\frac{70.906 g/mol}{208.233 g/mol}×100=34.0512791\% Cl≈34.051\% Cl$$

* 1. Is it an ionic or covalent compound? \_\_\_\_\_ionic compound\_\_\_\_\_\_
	2. Name the compound. \_\_\_\_\_barium chloride\_\_\_\_\_\_
1. Answer the following questions about hydrazine, N2H4 (8 points).
	1. What is the empirical formula? \_\_\_\_\_\_\_\_\_NH2 \_\_\_\_\_\_\_\_\_\_\_\_\_
	2. If the molar mass of hydrazine is 32.05 g/mol, how many moles of hydrazine are in 15.8 grams of hydrazine?

$$15.3 g N\_{2}H\_{4}×\frac{1 mol N\_{2}H\_{4}}{32.05 g N\_{2}H\_{4}}=0.477 mol N\_{2}H\_{4}$$

* 1. How many molecules of hydrazine are in 2.544 moles of hydrazine?

$2.544 mol N\_{2}H\_{4}×\frac{6.022×10^{23} molecules N\_{2}H\_{4} }{1 mol N\_{2}H\_{4}}=1.532×10^{24} molecules N\_{2}H\_{4}$

* 1. How many moles of hydrogen are in 1.22 moles of hydrazine?

$$1.22 mol N\_{2}H\_{4}×\frac{4 mol H}{1 mol N\_{2}H\_{4}}=4.88 mol H$$

Quiz 4B

1. Answer the following questions about SiCl4 (10 points).
	1. Calculate the molar mass.

Si: 1(28.068 g/mol) = 28.086 g/mol

Cl: 4(35.453 g/mol) = 141.813 g/mol

 + 169.898 g/mol ≈ 169.90 g/mol

* 1. Calculate the percent chlorine, by mass.

$$\%Cl=\frac{m\_{Cl}}{m\_{SiCl\_{4}}}×100=\frac{141.81 g/mol}{169.90 g/mol}×100=83.46674514\% Cl≈83.467\% Cl$$

* 1. Is it an ionic or covalent compound? \_\_\_\_\_covalent compound\_\_\_
	2. Name the compound. \_\_\_\_\_silicon tetrachloride\_\_\_

1. (True/False) The SI unit of energy is the Calorie (1 point).
2. A chemical reaction that absorbs energy is called an (exothermic/endothermic) reaction (1 point).
3. Answer the following questions about benzene, C6H6 (8 points).
	1. How many molecules of benzene are in 12.7 moles of benzene?

$12.7 mol C\_{6}H\_{6}×\frac{6.022×10^{23} molecules C\_{6}H\_{6} }{1 mol C\_{6}H\_{6}}=7.65×10^{24} molecules C\_{6}H\_{6}$

* 1. How many moles of hydrogen are in 0.6430 moles of benzene?

$$0.6430 mol C\_{6}H\_{6}×\frac{6 mol H}{1 mol C\_{6}H\_{6}}=3.858 mol H$$

* 1. What is the empirical formula? \_\_\_\_\_\_\_\_\_CH\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. If the molar mass of benzene is 78.11 g/mol, how many moles of benzene are in 24.3 grams of benzene?

$$24.3 g C\_{6}H\_{6}×\frac{1 mol C\_{6}H\_{6}}{78.11 g C\_{6}H\_{6}}=0.311 mol C\_{6}H\_{6}$$