Quiz 11A

Question 1. Identify if the following will increase or decrease the rate of dissolution (3 points):

1. NaCl salt is added to water, and the salt solution is stirred. \_\_\_\_\_\_increase\_\_\_\_\_\_\_\_\_\_\_\_
2. NaCl salt is added to water, and the salt solution is heated. \_\_\_\_\_\_increase\_\_\_\_\_\_\_\_\_\_\_\_
3. A large piece of NaCl salt is added to water. \_\_\_\_\_\_decrease\_\_\_\_\_\_\_\_\_\_\_\_

Question 2. Indicate whether each of the following compounds dissolves in water to give ions, molecules or both (3 points).

1. KNO3, a soluble salt \_\_\_\_\_ions\_\_\_\_\_\_\_\_\_\_\_\_\_
2. CH3CH2OH, a nonelectrolyte \_\_\_\_\_molecules\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. HF, a weak electrolyte \_\_\_\_\_both\_\_\_\_\_\_\_\_\_\_\_\_\_

Question 3. Answer to following questions about technetium-99m (9 points).

1. Technetium-99m decays by gamma. Write the nuclear equation.

$$\rightarrow +$$

1. A sample of technetium-99m has an activity of 1.5 mCi, how many disintergrations per second does it produce (1 Ci = 3.7 x 1010 disintergrations/s) in 5.0 seconds?

$$1.5 mCi×\frac{1 Ci}{1000 mCi}×\frac{3.7×10^{10} disintergrations/s}{1 Ci}=5.6×10^{7}\frac{disintergrations}{s}×5.0 s= 2.8×10^{8} disintergrations$$

Question 4. For the reaction below answer the following (5 points):

H2SO4 (aq) + H2O (l) $⇌$ H3O+ (aq) + HSO4- (aq)

1. Name the acid \_\_\_\_\_\_sulfuric acid \_\_\_\_\_\_\_\_\_\_\_\_\_
2. Name the base \_\_\_\_\_\_water\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Identify the Brønsted-Lowry acid \_\_\_\_\_\_H2SO4 \_\_\_\_\_\_\_\_\_\_\_\_\_
4. Identify the Brønsted-Lowry base \_\_\_\_\_\_H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quiz 11B

Question 1. Answer to following questions about phosphorus-32 (8 points).

1. Phosphorus-32 decays by beta emission. Write the nuclear equation.

$$\rightarrow +$$

1. A sample of phosphorus-32 has an activity of 2.0 mCi, how many disintergrations per second does it produce (1 Ci = 3.7 x 1010 disintergrations/s) in 12 seconds?

$$2.0 mCi×\frac{1 Ci}{1000 mCi}×\frac{3.7×10^{10} disintergrations/s}{1 Ci}=7.4×10^{7}\frac{disintergrations}{s}×12 s= 8.9×10^{8} disintergrations$$

Question 2. Identify if the following will increase or decrease the rate of dissolution (3 points):

1. Finely powdered NaCl salt is added to water. \_\_\_\_\_\_increase\_\_\_\_\_\_\_\_\_\_\_\_
2. NaCl salt is added to water, and the salt solution is cooled. \_\_\_\_\_\_decrease\_\_\_\_\_\_\_\_\_\_\_\_
3. NaCl salt is added to water, and the salt solution is heated. \_\_\_\_\_\_increase\_\_\_\_\_\_\_\_\_\_\_\_

Question 3. For the reaction below answer the following (5 points):

H2CO3 (aq) + H2O (l) $⇌$ H3O+ (aq) + HCO3- (aq)

1. Name the acid \_\_\_\_\_\_carbonic acid \_\_\_\_\_\_\_\_\_\_\_\_\_
2. Name the base \_\_\_\_\_\_water\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Identify the Brønsted-Lowry acid \_\_\_\_\_\_H2CO3 \_\_\_\_\_\_\_\_\_\_\_\_\_
4. Identify the Brønsted-Lowry base \_\_\_\_\_\_H2O\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Question 4. Indicate whether each of the following compounds dissolves in water to give ions, molecules or both (3 points).

1. Glucose, a nonelectrolyte \_\_\_\_\_molecules\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. NaCl, a strong electrolyte \_\_\_\_\_ions\_\_\_\_\_\_\_\_\_\_\_\_\_
3. H2CO3, a weak electrolyte \_\_\_\_\_both\_\_\_\_\_\_\_\_\_\_\_\_