Grossmont College Name: \_\_\_\_\_\_\_Key\_\_\_\_\_\_\_\_\_\_\_\_\_

Chemistry 102, Spring 2017

Quiz 2a (25 points) Date: \_\_\_\_\_\_\_\_\_\_\_\_

1. (4 points) A beaker is filled with 220.0 mL of salt water. A hardboiled egg with a mass of 39.483 g is then submerged in the salt water increasing the volume to 234.1 mL. What is the density of the egg in g/mL?

$$density= \frac{39.483 g}{234.1 mL-220.0 mL}=\frac{39.483 g}{14.1 mL}=2.80 {g}/{mL}$$

1. (6 points) Write nuclear equations for the following process:

|  |  |
| --- | --- |
| 1. Thorium-230 undergoes α decays
 | 1. Nitrogen-13 undergoes beta decay
 |
| 90230Th → 88226Ra + 24α | 713N → 813O + -10β |

1. (4 points) Mercury -197 is used for kidney scans and has a half-life of 3 days. If the 32 grams of mercury-197 is ordered, but takes 15 days to arrive, how much would arrive in the shipment that is still Mercury -197?

$$15 days ×\frac{1 half life}{3 days}=5 half lives$$

$$32 g ×\left( \frac{1}{2}\right)^{5}=1 g $$

1. (4 points) One cup of clam chowder contains 9.0 g of protein, 11.0 g of fat, and 15.0 g of carbohydrate. How many kilojoules are in the clam chowder from fat?

|  |  |
| --- | --- |
| Food Type | kcal /g(exact values) |
| Carbohydrate | 4 |
| Fat | 9 |
| Protein | 4 |

$$11.0 g of fat ×\frac{9 kcal}{1 g} ×\frac{4.184 kJ}{1 kcal}=414 kJ$$

1. (4 points) Choose the names of two elements that are in the following groups.

|  |  |
| --- | --- |
| 1. Halogens
 | (bromine, sodium, neon, fluorine) |
| 1. Noble Gases
 | (helium, argon, hydrogen, chlorine) |

1. (3 points) What are the number of protons, neutrons, and electrons in the following isotope?

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Protons\_\_\_13\_\_\_\_\_\_\_ Neutrons\_\_\_\_14\_\_\_\_\_ Electrons\_\_\_\_13\_\_\_\_\_\_