**Chemistry 11 REVIEW PACKAGE**

**Unit II & III Test**

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| **Learning Goal: To be able to operate in the chemistry lab in a safe manner** Concept 1: Location of equipmentConcept 2: Fire SafetyConcept 3: Chemical SafetyConcept 4: Emergency PrioritiesConcept 5: Laboratory EquipmentConcept 6: Writing a Formal Lab ReportConcept 7: Classifying Matter | **Learning Goal: to be able to measure and calculate in a way that is consistent with everyone in the scientific community** Concept 1: Chemical Nomenclature Concept 2: Determining the Number of Significant Figures Concept 3: Calculations with Significant Figures – Single OperationsConcept 4: Calculations with Significant Figures – Multiple OperationsConcept 5: Measuring with Chemistry EquipmentConcept 6: Modeling the Scientific Method Concept 7: Unit ConversionsConcept 8: Unit Conversions using Derived Quantities |

1. Give a qualitative and quantitative description of the following:

|  |  |  |
| --- | --- | --- |
|  | **Qualitative** | **Quantitative (estimate)** |
| A can of Coke  |  |  |
| A ruler |  |  |

1. *Plutonium is a radioactive chemical element with an atomic mass of 244 g/mol. It is found to have a silver appearance and will expand to 70.0% its volume when exposed to moist air and can ignite spontaneously. The density of plutonium was experimentally found to be 20 times greater than water.*

Fill out the table below by giving two observations and two pieces of data.

|  |  |  |
| --- | --- | --- |
|  | **Observation** | **Data** |
| Plutonium |  |  |
|  |  |

1. A beaker full of water is at room temperature. If you leave it alone, without adding any heat, it takes relatively a long time for water to evaporate. Describe the physical properties of water at room temperature by circling your answers below.

|  |  |
| --- | --- |
| Hardness:  | high / low / NA |
| Viscosity:  | high / low / NA |
| Malleability: | high / low / NA |
| Luster:  | high / low / NA |
| Melting Point: | 0°C / 100°C / NA |
| Freezing Temperature: | 0°C / 100°C / NA |

1. How many significant figures in the following?

**a)** 2.00032 mm **b)** 1000 m **c)** 50000.0 ns

**d)** 0.0000030000 MW **e)** 3.000 x 10-4 pL **f)** 0.06 L

1. Find the value of the mark on the following apparatus and include experimental uncertainty:
2. Calculate the following to the correct number of significant figures :

a) 37.89 x 24 = b) 45.9 / 35.22 – 10 =

c) 1000 / 23.4 x 4.57 x 10-4 = d) 478 x 10.9 – 33.90 + 23.000 / 3.4 =

1. If 1 mol of cyclobutane produces 1.34 x 103 J of heat when burned, how many mols of octane must be burned to produce 23000 J of heat?
2. If 1 L of blood has a mass of 1.2 kg;
	1. What is the mass of 8.34 L of blood?
	2. How much blood would a vampire need to drink, if he wants to gain 459 g by tomorrow?

|  |  |
| --- | --- |
| 1.24 x 109 nJ = ? kJ | 3333 dg / mL = ? kg / ML |

Calculate the equivalence between the following metric units: **Note:** (pico = 10-12); (nano = 10-9); (deci = 10-1)

1. If it takes 1012 J of energy to melt 1.00 g of iron, then;
	1. What mass of iron can be melted by 102 dJ of heat?
	2. How many kilojoules of heat are required to melt 79.4 g of iron?
2. A special star has a volume of 8.34 x 1041 L, an average density of 2.03 g/mL and made purely of deuterium (an isotope of hydrogen). If this star burns an average of 8.9 x 1010 kg per second, how many years will it take for the star to burn up (i.e. use up all the deuterium)?
3. Complete the following table:

|  |  |
| --- | --- |
| **CHEMICAL NAME** | **CHEMICAL FORMULA**  |
| phosphorus pentoxide |  |
| diiodine hexabromide |  |
| cesium hydroxide |  |
| sodium hydrogen carbonate |  |
|  | AgCl |
|  | Be(CH3COO)2 |
|  | H2SO4 |
|  | SiBr4 |
| tin(IV) nitrate |  |
| chromium(III) chromate |  |
| xenon disulphide |  |
| tricarbon tetraoxide |  |