

All work must be shown to receive credit. Use correct significant figures.

1. (5 points) A barrel contains 75.0 kg of ether. If the ether has a density of 0.633 g/ml, how many mL of ether are in the barrel?

$$? \text{ mL ether} = 75.0 \text{ g ether} \times \frac{1000 \text{ g ether}}{1 \text{ kg ether}} \times \frac{1 \text{ mL ether}}{0.633 \text{ g ether}} = 1.18 \times 10^5 \text{ mL ether}$$

2. (5 points) An alloy used to manufacture bicycles contains 12.6% titanium by mass. How many grams of this alloy contain 65.0 grams of titanium?

$$? \text{ g alloy} = 65.0 \text{ g Ti} \times \frac{100 \text{ g alloy}}{12.6 \text{ g Ti}} = 516 \text{ g alloy}$$

3. (6 points) When a clean platinum wire is heated in a flame it changes from a lustrous silver color to a dull red color. When the wire is removed from the flame it returns to a lustrous silver color. Is the change that occurs a physical or chemical change? Explain your reasoning.

Physical change

Physical changes can be observed without changing the identity of the substance. After heating the platinum wire and cooling, it regains its original properties, meaning that there has been no change in composition.

4. (4 points) Name the following compounds.

a.  $\text{C}_3\text{Br}_6$      tricarbon hexabromide

b.  $\text{Ca}_3\text{P}_2$      calcium phosphide

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1. (5 points) A barrel contains 75.0 kg of ether. If the ether has a density of 0.725 g/ml, how many mL of ether are in the barrel?

$$? \text{ mL ether} = 75.0 \text{ g ether} \times \frac{1000 \text{ g ether}}{1 \text{ kg ether}} \times \frac{1 \text{ mL ether}}{0.725 \text{ g ether}} = 1.03 \times 10^5 \text{ mL ether}$$

2. (5 points) An alloy used to manufacture bicycles contains 11.4% titanium by mass. How many grams of this alloy contain 65.0 grams of titanium?

$$? \text{ g alloy} = 65.0 \text{ g Ti} \times \frac{100 \text{ g alloy}}{11.4 \text{ g Ti}} = 570. \text{ g alloy}$$

3. (6 points) When a clean platinum wire is heated in a flame it changes from a lustrous silver color to a dull red color. When the wire is removed from the flame it returns to a lustrous silver color. Is the change that occurs a physical or chemical change? Explain your reasoning.

Physical change

Physical changes can be observed without changing the identity of the substance. After heating the platinum wire and cooling, it regains its original properties, meaning that there has been no change in composition.

4. (4 points) Name the following compounds.

