Chem15, Fall 2016, SJCC, Test1 Name KEY

Please read all the questions VERY carefully before answering. On scantron start from the same bubble number as the question number for your multtiple choice question. Write neatly. If I cannot read your answer, you will not receive any point. Use the attached periodic table and constant chart. No outside paper is allowed. Total points = 46 + (22x3=)66 = 112

SHORT ANSWER. In all calculations, write the set up equation first, then put the raw data with units. Then do your calculations. Points will be deducted if your answer is not clearly written.

1) Show calculations with units and sig. fig.to convert 16.32 gallon (gal) into milliliter (mL) (given 1 gal = 3.785 L and 1 L = 1000 mL). (6 pts.)

1) 6.177×10^4 mL

$$16.32 \text{ gal} \times \frac{3.785 \text{ L}}{1 \text{ gal}} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 61771.2 \text{ mL}$$

$$= 6.177 \times 10^4 \text{ mL}$$

GAL → ML

$$\text{gal} \times \frac{3.785 \text{ L}}{1 \text{ gal}} \times \frac{1000 \text{ mL}}{1 \text{ L}}$$

2) Calculate (with units and sig fig) how many in^3 are in 2.20 cm^3 (1 in = 2.54 cm.)? (8 pts.)

2) 0.134 in^3

$$2.20 \text{ cm}^3 \times \frac{1 \text{ in}^3}{(2.54 \text{ cm})^3} = 0.134252237 \text{ in}^3$$

$$= 0.134 \text{ in}^3$$

$cm^3 \rightarrow in^3$

$$\text{cm}^3 \times \frac{1 \text{ in}^3}{(2.54 \text{ cm})^3}$$

3) Calculate the density of 96.0 mL of a liquid (with correct number of sig fig and units) that has a mass of 90.5 g? (6 pts.)

3) 0.943 g/mL

$V = 96.0$ mL

$m = 90.5$ g

$d = \frac{m}{V}$

$$d = \frac{90.5 \text{ g}}{96.0 \text{ mL}}$$

$$d = 0.942708333 \text{ g/mL}$$

$$= 0.943 \text{ g/mL}$$

4) Write the formula for (3 pts. each; Total 9 pts.): 4) _____

(a) Ammonium phosphate: $NH_4^+ \; PO_4^{3-} \rightarrow \boxed{(NH_4)_3PO_4}$

(b) Calcium Sulfate: $Ca^{2+} \; SO_4^{2-} \rightarrow \boxed{CaSO_4}$

(c) Phosphorus pentachloride: $\boxed{PCl_5}$

5) Suppose it took 108 joules of energy to raise a bar of gold from 25.0°C to 29.7°C. Given that the specific heat capacity of gold is 0.128 J/g·°C, what is the mass (in grams) of the bar of gold? Show all your calculations with set up equation and units and sig. fig.. Given q = m.C. ΔT. (8 pts.) 5) 1.80×10^2 g

$q = 108\ j$

$\Delta T = 29.7\ ^\circ C - 25.0\ ^\circ C$

$c = 0.128\ j/g \cdot ^\circ C$

$m = ?$

$q = mc\Delta T$

$108\ j = m(0.128\ j/g \cdot ^\circ C)(4.7\ ^\circ C)$

$m = \dfrac{108\ j}{(0.128\ j/g \cdot ^\circ C)(4.7\ ^\circ C)} = 179.52127669\ g$

$= 1.80 \times 10^2\ g$

6) Write the name for (3 pts. each; Total 9 pts.): 6) _____

(a) $Ca(HSO_4)_2$: calcium bisulfate / calcium hydrogen sulfate

(b) $Al_2(CrO_4)_3$: aluminum chromate

(c) $Co(ClO_4)_2$: cobalt (II) perchlorate

MULTIPLE CHOICE. On scantron start from the same bubble number as the multiple choice question number. Choose the one alternative that best completes the statement or answers the question (3 pts. each).

7) The correct number of significant figures in the number 0.002320 is: 7) B

A) 3
B) 4
C) 7
D) ambiguous
E) none of the above