

Name:  
Date:  
Hour:

CALVIN

### Chemistry ~ Ch. 3 Review

#### Matching

- |  |                     |
|--|---------------------|
| 1) <u>E</u> amount of matter an object has         | a) Kelvin           |
| 2) <u>G</u> SI prefix meaning 1000                 | b) SI               |
| 3) <u>A</u> SI unit of temperature                 | c) meter            |
| 4) <u>C</u> SI unit for length                     | d) kilogram         |
| 5) <u>K</u> amount of mass per unit of volume      | e) mass             |
| 6) <u>J</u> SI prefix meaning 0.1                  | f) cubic centimeter |
| 7) <u>L</u> SI base unit for time                  | g) kilo-            |
| 8) <u>H</u> amount of space an object occupies     | h) volume           |
| 9) <u>M</u> SI prefix meaning 0.001                | i) centi-           |
| 10) <u>D</u> SI base unit for mass                 | j) deci-            |
| 11) <u>I</u> SI prefix meaning 0.01                | k) density          |
| 12) <u>F</u> derived unit of volume                | l) second           |
| 13) <u>B</u> system of measurement used world-wide | m) milli-           |

#### Significant Digits

Indicate the number of significant digits in the following:

- |   |                                 |
|---|---------------------------------|
| 14) 547 meters <u>3</u>                   | 20) 10 tons <u>1</u>            |
| 15) 800.0 Liters <u>4</u>                 | 21) 0.0300 centimeters <u>3</u> |
| 16) 1.63 x 10 <sup>5</sup> grams <u>3</u> | 22) 19 porcupines <u>∞</u>      |
| 17) 0.000002 feet <u>1</u>                | 23) 0.00540 ounces <u>3</u>     |
| 18) 2004 gallons <u>4</u>                 | 24) 3.620 millimeters <u>4</u>  |
| 19) 170,000 kilometers <u>2</u>           | 25) 5,000,800 seconds <u>5</u>  |

#### Round the following numbers to the indicated # of significant digits:

- 26) 1234.67 m → 4 sig digs 1235 m
- 27) 0.742 L → 1 sig dig 0.7 L
- 28) 4000 g → 2 sig digs (\* hint: rhymes with pie-in-tiffic rotation) 4.0 x 10<sup>3</sup> g
- 29) 1.737 x 10<sup>3</sup> cg → 3 sig digs 1.74 x 10<sup>3</sup> cg

30. Three different people weigh a standard mass of 2.00 g on the same balance. Each person obtains a reading of 7.32 g for the mass of the standard. These results imply that the balance that was used is \_\_\_\_\_.

- a. accurate   b. accurate and precise   c. precise   d. neither accurate nor precise

31. Which of the following measurements is expressed to three significant figures?

- a. 0.007 m   b. 7077 mg   **c.  $7.30 \times 10^3$  Km**   d. 0.070 mm

32. Express the sum of 7.68 m and 5.0 m using the correct number of significant digits.

**12.7**

33. What is the measurement 222.009 mm rounded off to **four** significant digits?

**222.0**

34. Chlorine boils at 239 K. What is the boiling point of chlorine expressed in degrees Celsius?

**-34°C**

35. What is the quantity 987 centigrams expressed in grams?

**9.87g**

36. The expression of 5008 km in scientific notation is \_\_\_\_\_

**$5.008 \times 10^3$**

37. Briefly explain the difference between precision and accuracy.

*close together*

*close to target*

38. When multiplying and dividing measured quantities, the number of significant figures in the result should be equal to the number of significant figures in \_\_\_\_\_.

- a. all of the measurements   b. the least and most precise measurements  
 c. the most precise measurement   **d. the least precise measurement**

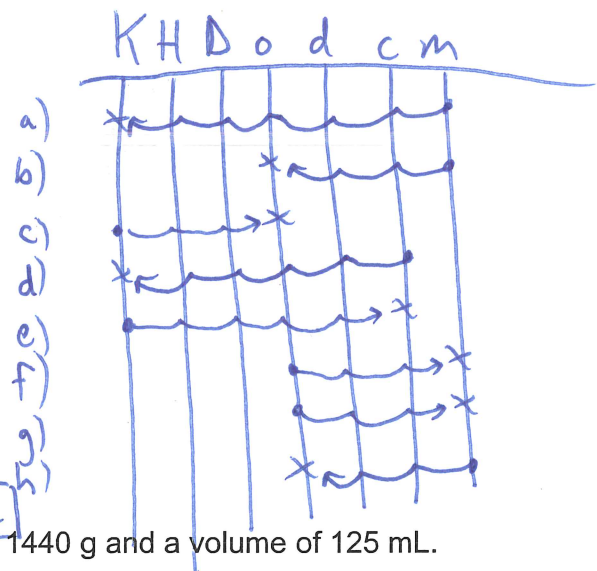
39. What are two **SPECIFIC** advantages of SI system over other systems of measurement. (hint: be specific ~ easier means nothing ~ explain WHY it is easier)

*multiples of ten, less to memorize, etc...*

40) Make the following conversions:

BE SURE TO INCLUDE UNITS! BOX IN ANSWER! SHOW WORK!

- a)  $82 \text{ mL}$  to kL **0.000082 kL**
- b.  $600,000 \text{ mg}$  to g **600g**
- c.  $0.0037 \text{ km}$  to m **3.7m**
- d.  $92 \text{ cL}$  to kL **0.00092 kL**
- e.  $0.00000064 \text{ kg}$  to cg **0.064cg**
- f.  $300 \text{ L}$  to mL **300,000 mL**
- g.  $5.1 \text{ m}$  to mm **5,100mm**
- h.  $7,000,000 \text{ mL}$  to L **7,000L**
- i.  $53 \text{ }^\circ\text{C}$  to K **326K**
- j.  $183 \text{ K}$  to  $^\circ\text{C}$  **-90°C**



41) Find the density of an unknown metal with a mass of 1440 g and a volume of 125 mL.

Identify the metal using your text!

$D = ?$   
 $m = 1440 \text{ g}$   
 $V = 125 \text{ mL}$

$$D = \frac{m}{V} = \frac{(1440 \text{ g})}{(125 \text{ mL})} = \boxed{11.5 \frac{\text{g}}{\text{mL}}}$$

**Lead**

42) Suppose an object has a density of  $2.70 \text{ g/cm}^3$  and a mass of  $45.00 \text{ g}$ . Find the volume.  
 (SHOW WORK! UNITS! SIG DIGS!)

$$D = 2.70 \text{ g/cm}^3$$

$$M = 45.00 \text{ g}$$

$$V = ?$$

$$D = \frac{M}{V} \Rightarrow V = \frac{M}{D} = \frac{(45.00 \text{ g})}{(2.70 \text{ g/cm}^3)} = 16.7 \text{ cm}^3$$

43) Determine the mass of a ball with a density of  $1.50 \text{ g/mL}$  and volume of  $0.00700 \text{ L}$ .  
 (SHOW WORK! UNITS! SIG DIGS!) \*HINT be careful!

$$D = 1.50 \text{ g/mL}$$

$$V = 0.00700 \text{ L} \rightarrow 7.00 \text{ mL}$$

$$M = ?$$

$$D = \frac{M}{V} \Rightarrow M = D \cdot V = (1.50 \text{ g/mL})(7.00 \text{ mL}) = 10.5 \text{ g}$$

44) Use factor-label to make the following conversions:

a)  $3.5 \text{ m} \rightarrow \text{cm}$

$$3.5 \text{ m} \left| \frac{100 \text{ cm}}{1 \text{ m}} \right. = 350 \text{ cm}$$

b)  $55 \text{ mg} \rightarrow \text{g}$

$$55 \text{ mg} \left| \frac{1 \text{ g}}{1000 \text{ mg}} \right. = 0.055 \text{ g}$$

c)  $625 \text{ inches} \rightarrow \text{m}$  (\*hint: 1 inch = 2.54 cm)

$$625 \text{ in} \left| \frac{2.54 \text{ cm}}{1 \text{ in}} \right| \left| \frac{1 \text{ m}}{100 \text{ cm}} \right. = 15.9 \text{ m}$$

45) The length measurement is  $1.50 \text{ cm}$ . The correct value is  $1.36 \text{ cm}$ . Calculate the % error.

$$\frac{|1.36 - 1.50|}{1.36} \times 100 = 10.3\%$$

46) Round YOUR address to the following sig digs (if your address is very small use: 2643)

4	2643	2643
3	2643	2640
2	2643	2600
1	2643	3000

### Ch.3 Test Concepts

Significant digit (rounding also)

Scientific notation

Density problems

Conversions

\*Metric (KHDodcm) \*Time/Distance/etc \*FACTOR LABEL \*Temperature (Celsius/Kelvin)

% error

Precision vs. accuracy

**GO VIKINGS!!!**

