

Name \_\_\_\_\_ Desk \_\_\_\_\_

Date \_\_\_\_\_ Laboratory Instructor \_\_\_\_\_

Liquid unknown no. \_\_\_\_\_

Solid unknown no. \_\_\_\_\_

## REPORT SHEET FOR EXPERIMENT 2

### IDENTIFICATION OF SUBSTANCES BY PHYSICAL PROPERTIES

#### A. Solubility

	Water	Cyclohexane	Alcohol
Naphthalene	_____	_____	_____
Toluene	_____	_____	_____
Liquid unknown	_____	_____	_____
Solid unknown	_____	_____	_____

#### B. Density

##### *Solid*

Final volume of liquid in cylinder \_\_\_\_\_ mL  
Initial volume of liquid in cylinder \_\_\_\_\_ mL  
Volume of solid \_\_\_\_\_ mL  
Weight of solid \_\_\_\_\_ g  
(show calculations)

Density of solid \_\_\_\_\_ g/mL

##### *Liquid*

Volume of liquid \_\_\_\_\_ mL  
Volume of liquid corrected for the  
pipet correct \_\_\_\_\_ mL  
Weight of 50-mL Erlenmeyer plus  
~ 10 mL of unknown \_\_\_\_\_ g  
Weight of 50-mL Erlenmeyer \_\_\_\_\_ g  
Weight of liquid \_\_\_\_\_ g  
(show calculations)

Density \_\_\_\_\_ g/mL

### C. Melting Point of Solid Unknown

Observed melting point \_\_\_\_\_ °C  
Corrected (apply thermometer  
correction to obtain) \_\_\_\_\_ °C  
Observed melting-point range \_\_\_\_\_ °C  
Corrected (apply thermometer  
correction to obtain) \_\_\_\_\_ °C

### D. Boiling Point of Liquid Unknown

Observed \_\_\_\_\_ °C  
Corrected (apply thermometer  
correction to obtain) \_\_\_\_\_ °C  
Estimated true (normal) b.p. (apply  
pressure correction to obtain) \_\_\_\_\_ °C

### E. Unknown Identification

Solid unknown \_\_\_\_\_  
Liquid unknown \_\_\_\_\_

## QUESTIONS

1. Is thymol a solid or a liquid at room temperature?
2. What solvent would you use to measure the density of zinc chloride?
3. Convert your densities to kg/L and compare these values with those in g/mL.
4. If air bubbles were trapped in your solid beneath the liquid level in your density determination, what error would result in the volume measurement, and what would be the effect of this error on the calculated density?
5. A liquid unknown was found to be insoluble in water and soluble in cyclohexane and alcohol; the unknown was found to have a boiling point of 107°C at 658 mm Hg. What is the substance? What could you do to confirm your answer?
6. A liquid that has a density of  $0.80 \pm 0.01$  g/mL is insoluble in cyclohexane. What is the liquid?

7. What is the boiling point of hexane at 600 mm Hg?

Consult a handbook for the following questions and specify handbook used.

Handbook: \_\_\_\_\_

8. Osmium is the densest element known. What are its density and melting point?

9. What is the color of  $\text{MnCl}_2$ ? What is its solubility in cold water?

10. What are the formula, molecular weight, and color of lead cyanate?