

## exercise 3-B

## WHAT IS IT?

Properties of Some Elements						
Name	Phase At Room Temperature	Density (g/cm <sup>3</sup> )	Density (g/L)	Melting Point (°C)	Boiling Point (°C)	Appearance
Aluminum	solid	2.7		659.7	2057	silvery
Argon	gas		1.78	-189.2	-185.7	colorless
Bismuth	solid	9.8		271.3	1470	silvery-white or reddish
Bromine	liquid	2.928		-7.2	58.8	dark red
Calcium	solid	1.54		848	1240	silvery-white
Chlorine	gas		3.214	-103	-34.6	greenish-yellow
Cobalt	solid	8.9		1495	3550	silvery-gray
Copper	solid	8.92		1083	2595	reddish luster
Gold	solid	19.3		1063	2600	yellow
Helium	gas		0.18	-272 (at high pressure)	-268.9	colorless
Hydrogen	gas		0.09	-259	-252.8	colorless
Iodine	solid	4.93		113-114 sublimes	184.4	silvery blackish solid, violet gas
Iron	solid	7.86		1535	3000	silvery
Lead	solid	11.3		327	1515	silvery-black
Magnesium	solid	1.74		651	1107	silvery-white
Mercury	liquid	13.59		-38.87	356.58	silvery-white
Nickel	solid	8.90		1455	2730	silvery
Oxygen	gas		1.429	-218.4	-183	colorless
Phosphorus	solid	1.82		44.1	280	yellow or white
Silver	solid	10.5		960.8	1950	silvery white
Sulfur	solid	2.0		112.8	444.6	yellow
Zinc	solid	7.14		419.5	907	bluish-white, lustrous

Sublimes: turns directly from solid to gas  
Helium's melting point is determined under 26 atm of pressure and Argon's, under 47 atm.

## PART I

- Generally, it is recognized by a bright yellow color. It is brittle and has a boiling point of 444.6°C.

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- This foil has a luster and can conduct electricity. **its density is 2.7 g/cm<sup>3</sup>**

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- A dull surface hides the luster of this solid, which has a density of 11.34 g/cm<sup>3</sup>. The great density makes it possible for the solid to hold a fishline under fresh water.

4. You can't see this colorless gas, which is slightly denser than hydrogen. It is used to fill balloons.

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5. This yellow, malleable substance is used to make rings. Its density is  $19.3 \text{ g/cm}^3$ .

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6. Sometimes you find this substance as gray crystals. At higher temperatures you can see it as a violet gas. It is often used in making an antiseptic to treat cuts.

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7. There is a rosy luster to this electrical conductor's appearance. It melts at approximately  $272^\circ\text{C}$ .

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8. Scientist X has discovered a silvery white solid that is lighter in density than aluminum. **its melting point is  $848^\circ\text{C}$**

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9. This material is a dark red liquid at room temperature. It does not conduct electricity.

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10. This element is dull and brittle. It is a nonconductor of electricity. It melts at  $44^\circ\text{C}$

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5. The following data is obtained from the procedures of Experiment 3.3:

DATA CHART

Property of Substance	Sample Number				
	1	2	3	4	5
Electrical conductor	no	yes	yes	yes	no
Ductile	no	yes	yes	yes	no
Malleable	no	yes	yes	yes	no
Mass	9.86 g	89.0 g	39.4 g	5.46 g	26.0 g
Volume	$2.0 \text{ cm}^3$	$10.0 \text{ cm}^3$	$5 \text{ cm}^3$	$3.0 \text{ cm}^3$	$130.0 \text{ cm}^3$
Density $\frac{\text{mass}}{\text{volume}}$					

**INFO**

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Metals are ductile, malleable, and are conductors of heat and electricity.

Which of the above samples is (are) a metal?

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Which of the above samples is (are) a nonmetal?

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Which sample has the smallest density?

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Which sample has the greatest density?

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If water has a density of  $1 \text{ g/cm}^3$ , which samples are lighter than water and will float?

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