

| 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<br>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.  
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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 g/cm<sup>3</sup>.  
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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°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°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°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 cm <sup>3</sup> | 10.0 cm <sup>3</sup> | 5 cm <sup>3</sup> | 3.0 cm <sup>3</sup> | 130.0 cm <sup>3</sup> |
| Density $\frac{\text{mass}}{\text{volume}}$ |                     |                      |                   |                     |                       |

#### INFO

1  
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?  
\_\_\_\_\_

Which sample has the smallest density?  
\_\_\_\_\_

Which sample has the greatest density?  
\_\_\_\_\_

If water has a density of 1 g/cm<sup>3</sup>, which samples are lighter than water and will float?  
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