SAS inquiry: Melting points and Boiling Points

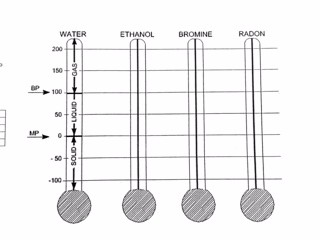
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**Purpose**: In this activity we will examine the melting and boiling points of pure substances (elements from the periodic table or compounds). You will learn how to plot the points on a thermometer and to analyze the information the diagrams provide.

Table 1:

|  |  |  |
| --- | --- | --- |
| **Substance** | **Melting point oC** | **Boiling point oC** |
| Water | 0 | 100 |
| Ethanol | -115 | 78 |
| Bromine | -7 | 59 |
| Radon | -71 | -61 |

1. Take a pencil to draw a line for the melting points and boiling points for each substance.
2. With a yellow colored pencil, color the area of the thermometer directly above the boiling point line.
3. With a red colored pencil, color in the area between the boiling point and melting point lines.
4. With a blue pencil, color in the area of the thermometer below the melting point line.
5. Use arrows to help you label the MP and BP of each substance.
6. In the yellow area, write GAS
7. In the red area, write LIQUID
8. In the blue area, write SOLID



Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pd\_\_\_\_\_\_\_\_

**Analysis of Changing States and the Constancy of melting and boiling points:**

True or False:

1. Water is always a liquid at 350C \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Bromine is a gas at – 600C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Radon is a solid as 100 0C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Bromine is a solid at 00C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Bromine melts at a lower temperature than ethanol\_\_\_\_\_\_\_\_\_\_\_\_

Short Answer:

1. Which substance has the LOWEST boiling point?
2. Which substance has the HIGHEST boiling point?
3. Which substance has the LOWEST melting point?
4. List the substances that are LIQUIDS at – 300C.
5. List the substances that are GASES at 700C.
6. List the substances that are SOLIDS at 100C.

Lets Think!!!! Answer these after Part 2 is complete.

1. What is the LOWEST temperature at which all FOUR substances will be gases?
2. What is the HIGHEST temperature at which all FOUR substances will be solids?
3. There are 100 degrees between water’s melting and boiling point. How many degrees are there between ETHANOL’s melting and boiling points?
4. All pure substances change states at constant temperatures. When a pure substance like water, bromine, radon, and ethanol change from a liquid to a gas or solid to a liquid, are they becoming something NEW or just CHANGING FORM (or STATE)?