MELTING POINT, FREEZING POINT, AND BOILING POINT

A characteristic property of a substance is a property that does not depend on the amount (mass) of the substance. It can be used to identify a substance.

Melting point, freezing point, and boiling point are characteristic properties of chemical substances. When a solid substance is heated, it will reach a specific temperature at which it begins to melt (become liquid). This is its melting point. When a liquid is cooled, it reaches a temperature at which it begins to freeze (become solid). This is its freezing point. Generally, for a particular substance, the melting point temperature and freezing point temperature are the same.

When a liquid is heated, it will reach a temperature at which it begins to become a gas. This is its boiling point. The process in which a liquid becomes a gas is called evaporation. The opposite process, in which a gas becomes a liquid, is called condensation.

The melting, freezing, and boiling point temperatures of a substance are physical properties useful to a scientist.
An experiment of melting ice pure water the result of the melting can be plotted as shown:

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Melting starts (freezing)</th>
<th>Melting completes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Look at the graph and complete the following:
   - **AB** - the substance is completely ____________.
   - **Point B** - ____________ begins at ________. (The first drop of _______ appears).
   - **BC** - The substance be as a ________ of ________ and ________
   - **Point C** - The last drop of ________ is formed.
   - **CD** - The substance is completely ________

2. Complete the following table:

<table>
<thead>
<tr>
<th>State of water</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

3. Which part of the graph has fixed temperature:

..............................................................
4. A compound $X$ has a melting point of $-60^\circ C$ and a boiling point of $14^\circ C$. At which temperature is $X$ a liquid?

![Temperature Scale]

answer: ............................................................

5. A compound $X$ has a melting point of $-60^\circ C$ and a boiling point of $14^\circ C$. At which temperature is $X$ a gas?

![Temperature Scale]

answer: ............................................................

Conclusion: ............................................................

6. This curve is melting and boiling curve for the pure substance (Z):

![Graph with labeled points]

(a) Label on the diagram the different states of matter.
(b) Read from the graph the melting point and boiling point of the substance.
7. What the different between melting point and freezing point?

8. What the different between boiling point and evaporation point?

the end