



Phase Change Worksheet

The graph was drawn from data collected as a substance was heated at a constant rate. Use the graph to answer the following questions.

At **point A**, the beginning of observations, the substance exists in a solid state. Material in this phase has _____ volume and _____ shape. With each passing minute, _____ is added to the substance. This causes the molecules of the substance to _____ more rapidly which we detect by a _____ rise in the substance. At **point B**, the temperature of the substance is _____ °C. The solid begins to _____. At **point C**, the substance is completely _____ or in a _____ state. Material in this phase has _____ volume and _____ shape. The energy put to the substance between minutes 5 and 9 was used to convert the substance from a _____ to a _____. This heat energy is called the **latent heat of fusion**.

Between 9 and 13 minutes, the added energy increases the _____ of the substance. During the time from **point D to point E**, the liquid is _____. By **point E**, the substance is completely in the _____ phase. Material in this phase has _____ volume and _____ shape. The energy put to the substance between minutes 13 and 18 converted the substance from a _____ to a _____ state. This heat energy is called the **latent heat of vaporization**. Beyond **point E**, the substance is still in the _____ phase, but the molecules are moving _____ as indicated by the increasing temperature.

Which of these three substances was likely used in this phase change experiment?

Substance	Melting point	Boiling point
Bolognium	20 °C	100 °C
Unobtainium	40 °C	140 °C
Foosium	70 °C	140 °C

BONUS: For water, the value for the latent heat of vaporization is 6.8 times greater than the latent heat of fusion. Imagine we were adding heat at a constant rate to a block of ice in a beaker on a hot plate, and it took 4 minutes for the ice to melt completely. How long would it take, after the water started boiling, for the beaker to be completely empty (the liquid water totally converted to water vapor)?