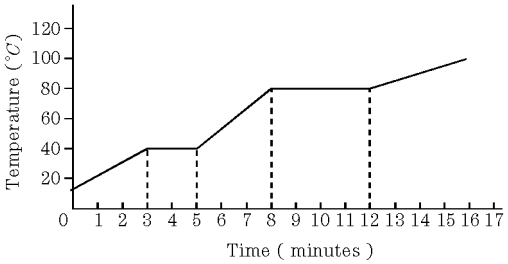
Phase Change Diagram

Name: _____ **Date:** _____

1. The graph shows the relationship between temperature and time as heat is added to one mole of a substance at a rate of 100 calories per minute. The substance is in the solid phase at Time = 0 minutes.



The temperature at which the substance begins to boil is

A. 10°C B. 40°C

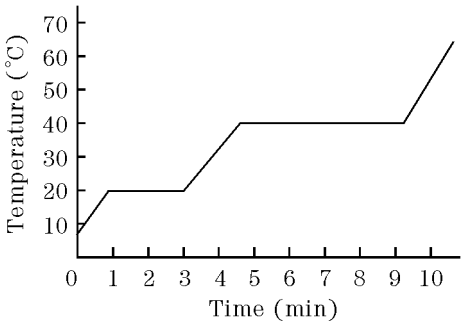
C. 80°C D. 110°C

2. Which change of phase is exothermic?

A. gas to liquid B. solid to liquid

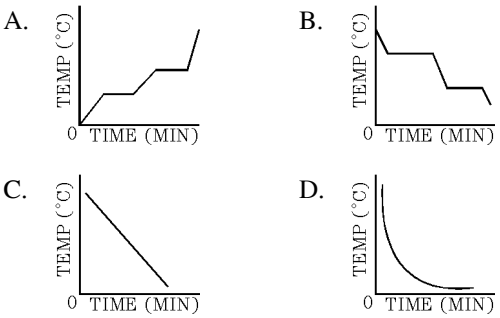
C. solid to gas D. liquid to gas

3. The graph shown represents changes of state for an unknown substance. What is the boiling temperature of the substance?

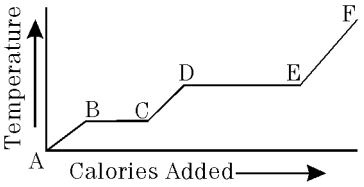


A. 0°C B. 20°C C. 70°C D. 40°C

4. Which graph shown could represent the uniform cooling of a substance, starting with the gaseous phase and ending with the solid phase?



5. The graph represents the uniform heating of a water sample at standard pressure, starting at a temperature below 0°C.

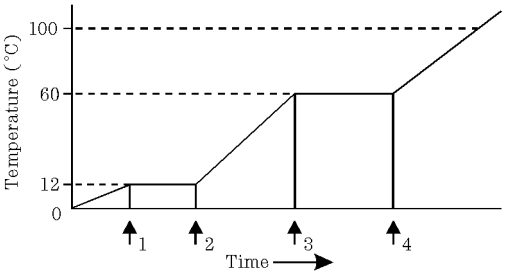


The number of calories required to vaporize the entire sample of water at its boiling point is represented by the interval between

A. A and B B. E and F

C. C and D D. D and E

6. The diagram shown represents the uniform heating of a substance that is a solid at t_0. What is the freezing point of the substance?



A. 1°C B. 12°C

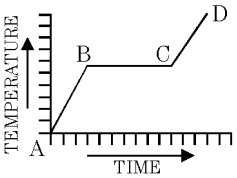
C. 60°C D. 100°C

7. Which phase change is endothermic?

A. $Fe(\ell) \rightarrow Fe(s)$ B. $CO_2(s) \rightarrow CO_2(g)$

C. $NH_3(g) \rightarrow NH_3(\ell)$ D. $H_2O(\ell) \rightarrow H_2O(s)$

8. The graph shown represents the relationship between temperature and time as heat was added uniformly to a substance, starting as a solid below its melting point. During the *BC* portion of the curve, the average kinetic energy of the molecules of the substance



A. increases and the potential energy increases

B. decreases and the potential energy increases

C. remains the same and the potential energy increases

D. remains the same and the potential energy decreases

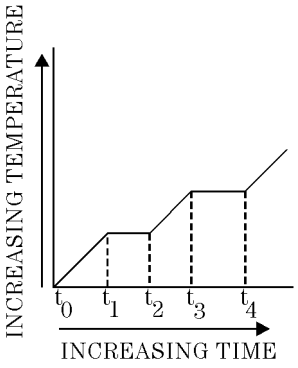
9. The graph shown represents the relationship between the temperature and time for a substance that was heated uniformly starting at t_0. The substance was in the solid phase at t_0. During which time interval does the heat absorbed by the substance represent the heat of fusion of the substance?

A. t_0 to t_1

B. t_1 to t_2

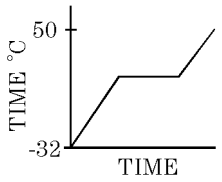
C. t_2 to t_3

D. t_3 to t_4

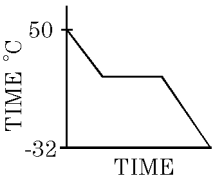


10. A student collected data in an experiment in which the uniform cooling of a water sample was observed from 50° C to −32° C. Which graph most likely represents the results obtained by the student?

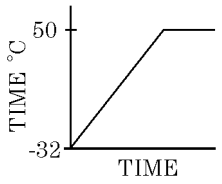
A.



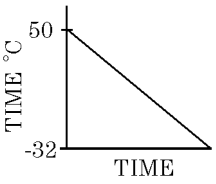
B.



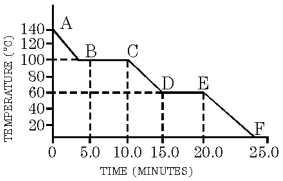
C.



D.



11. The graph shown represents a substance X, in the form of a gas, uniformly cooled from an initial temperature of 140° C.



The time required to cool gas X from *B* to a liquid at its freezing point is

A. 2.5 minutes B. 10.0 minutes

C. 12.5 minutes D. 15.0 minutes

12. In which segment of the graph is substance X in the liquid phase only?

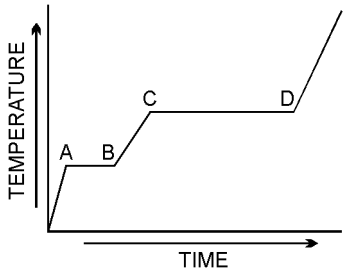
A. *AB* B. *BC* C. *CD* D. *DE*

13. In the change represented by the equation $CO_2(s) \rightarrow CO_2(g)$, the $CO_2(s)$ is

A. melting B. freezing

C. condensing D. subliming

14. In the heating curve shown, heat is applied to a solid substance at a constant rate. What accounts for the fact that segment *CD* is longer than segment *AB*?



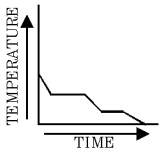
A. Boiling occurs at a higher temperature than melting.

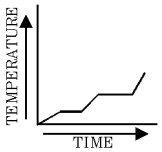
B. The heat of vaporization is greater than the heat of fusion.

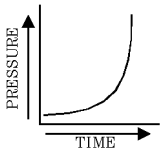
C. Average kinetic energy increases at a greater rate during boiling than during melting.

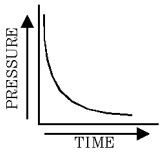
D. Potential energy is being released during boiling.

15. Which graph best represents a change of phase from a gas to a solid?

A.


B.


C.


D.


Phase Change Diagram 12/15/2015

1.
Answer: C

2.
Answer: A

3.
Answer: D

4.
Answer: B

5.
Answer: D

6.
Answer: B

7.
Answer: B

8.
Answer: C

9.
Answer: B

10.
Answer: B

11.
Answer: C

12.
Answer: C

13.
Answer: D

14.
Answer: B

15.
Answer: A