

Bell Work, Oct 28 – 31, 2013

Gasses, Pressure, Kinetic Theory,
Temperature, Pressure, Heating Curve

Bell Work, Monday, Nov 4, 2013

1. What is a phase?

Same as a state of matter: solid, liquid, gas, plasma.

2. What is a phase change?

A phase change is a change from one state to another.

3. Explain the following phase changes:

condensing (condensation): gas → liquid

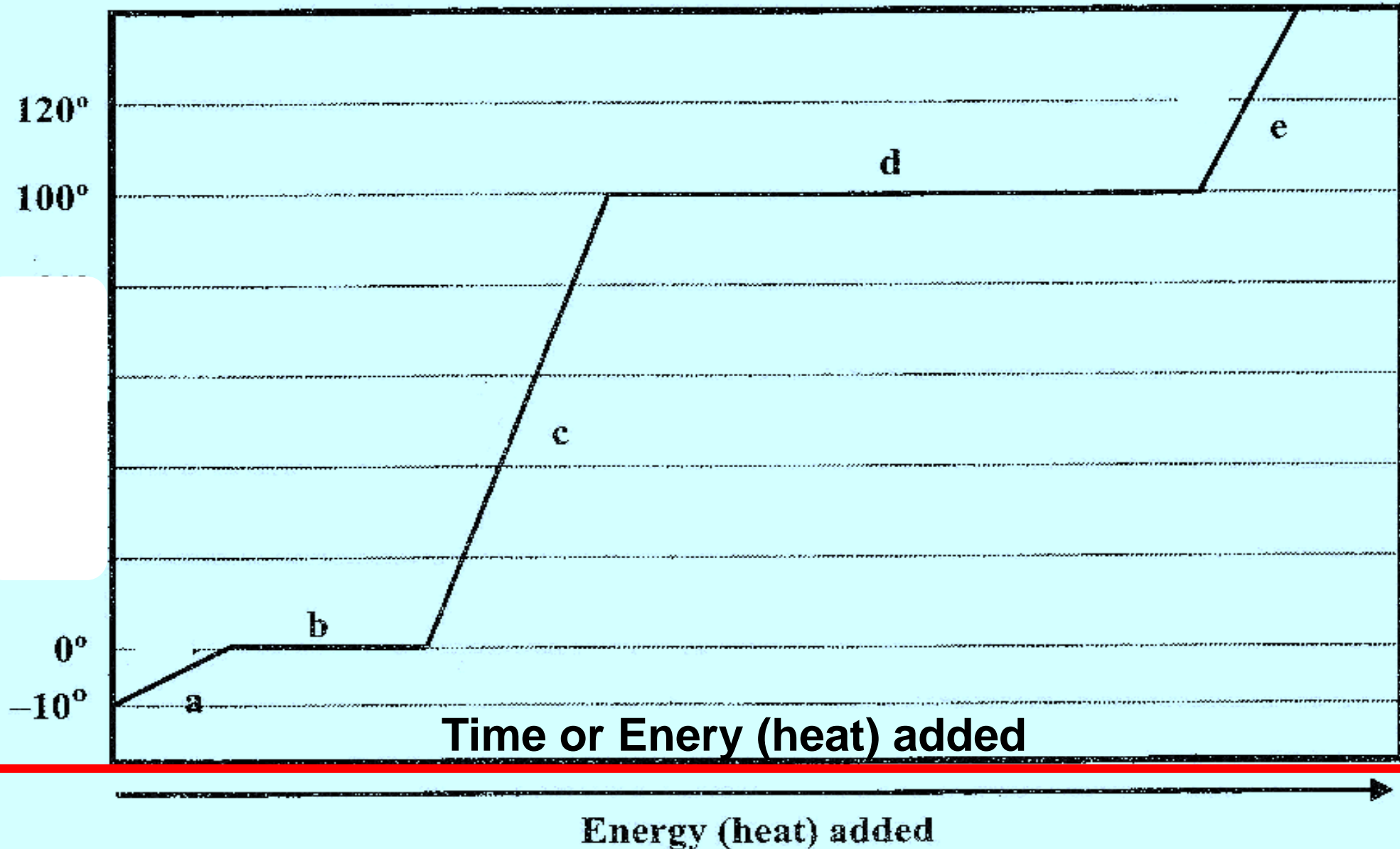
boiling liquid → gas

melting solid → liquid

freezing liquid → solid

Bell Work, Monday, Nov 4, 2013

Changing the States of Water



4. What phase is a?

solid

5. What phases exist together at b?

Solid & liquid

6. What phase is c?

liquid

7. What phases exist together at d?

Liquid and gas

8. What phase is e?

gas

9. What section of the graph above represents melting?

B

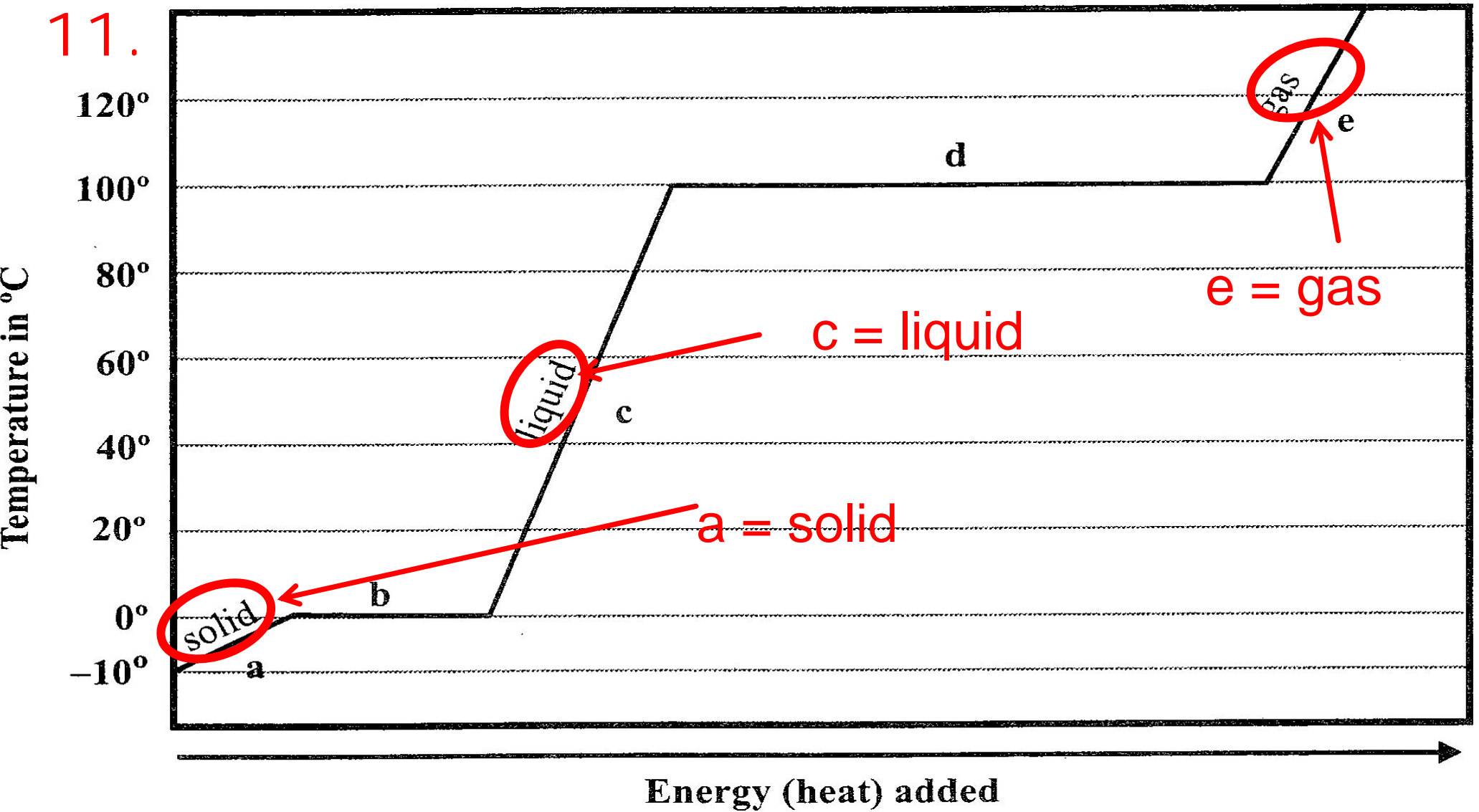
10. What section of the graph above represents boiling?

D

11. Label the sections of the graph: solid, liquid, gas.

Bell Work Answers, Mon, Nov, 4

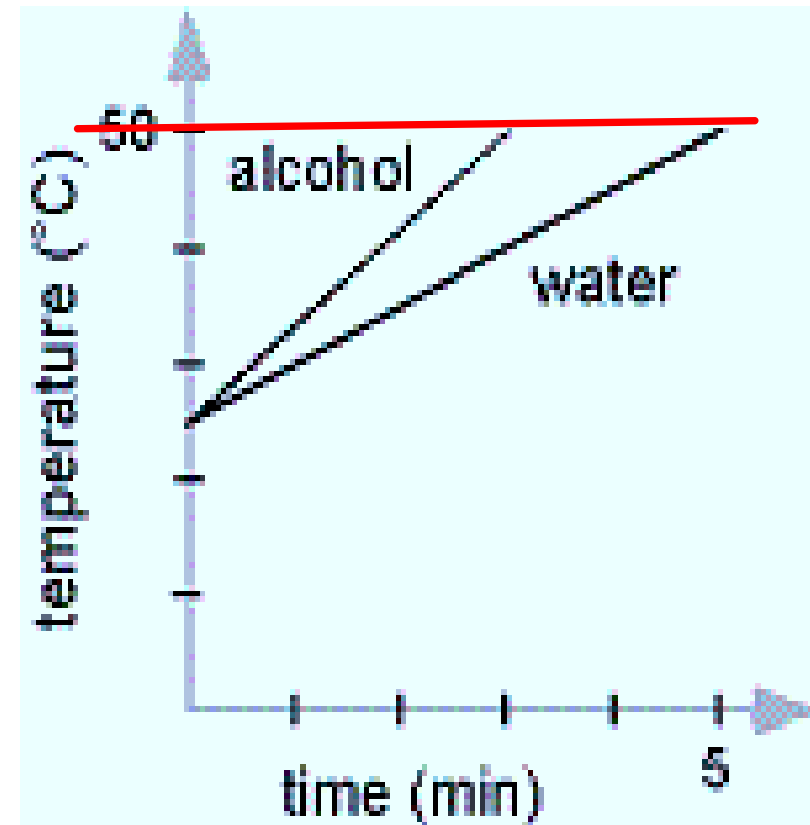
Changing the States of Water



Bell Work, Tuesday, Nov 5, 2013

1. Equal masses of water and alcohol, at 25°C , are heated at the same rate. After 3 minutes the temperature of the alcohol is 50°C . It took 5 minutes for the water to reach 50°C . Which of the following is true once the water and alcohol have both reached 50°C ?

- a. The water received more energy than the alcohol.
- b. The alcohol received more energy than the water.
- c. Both received the same amount



2. A sample of water is brought to a boil. Inside a bubble are(is)

- a. particles of hydrogen gas and oxygen
- b. gas
- c. just empty space.
- d. particles of air.
- e. particles of water.

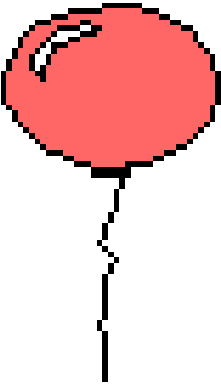
Amount of Energy

Bell Work, Tuesday, Nov 5, 2013

3. The evening before a birthday party, you fill several balloons with helium gas.

The birthday party occurs on a hot summer day.

A guest at the party dives into the swimming pool holding inflated balloon. The balloon gets smaller when she dives bottom of the pool. Which of the following explains this observation?



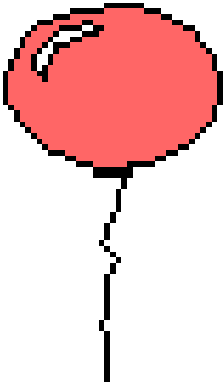
- a. Some of the helium particles escaped through pores in the latex.
- b. The helium particles became smaller than before.
- c. The helium particles lost their strength.
- d. The particles moved closer to each other.

Bell Work, Tuesday, Nov 5, 2013

4. The evening before a birthday party, you fill several balloons with helium gas.

The birthday party occurs on a hot summer day.

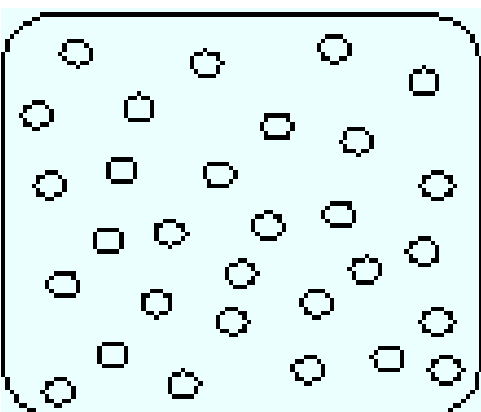
The next day (the same hot temperature) the latex balloons are noticeably smaller. Which of the follow explains this observation?



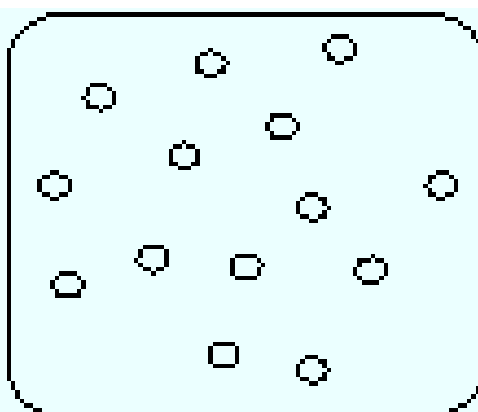
- ☒ a. Some of the helium particles escaped through pores in the latex.
- b. The helium particles became smaller than before.
- c. The helium particles lost their strength.
- d. The particles moved closer to each other.

Bell Work, Tuesday, Nov 5, 2013

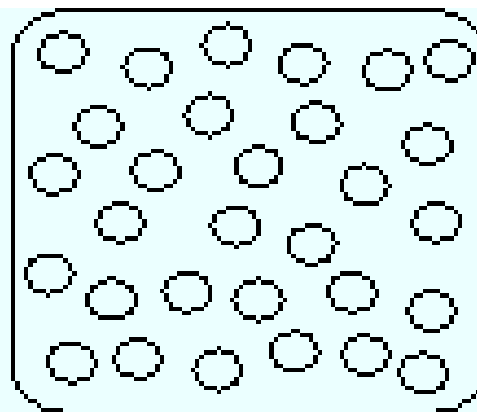
5. A substance was allowed to evaporate completely to a gas in a sealed container. Which of the diagrams below best represents the contents of the sealed container?



A



B



C



D

a. A

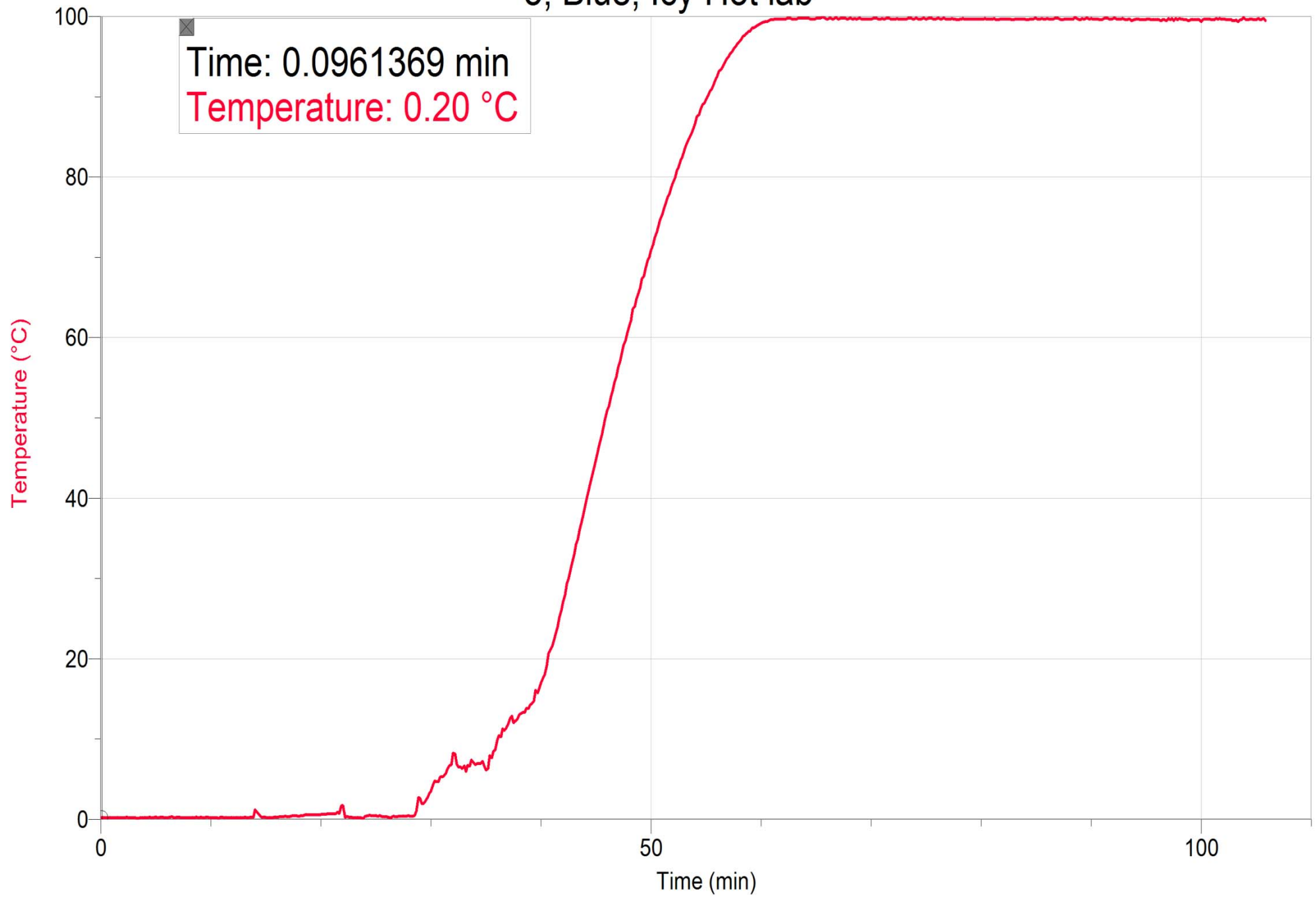
d. D

b. B

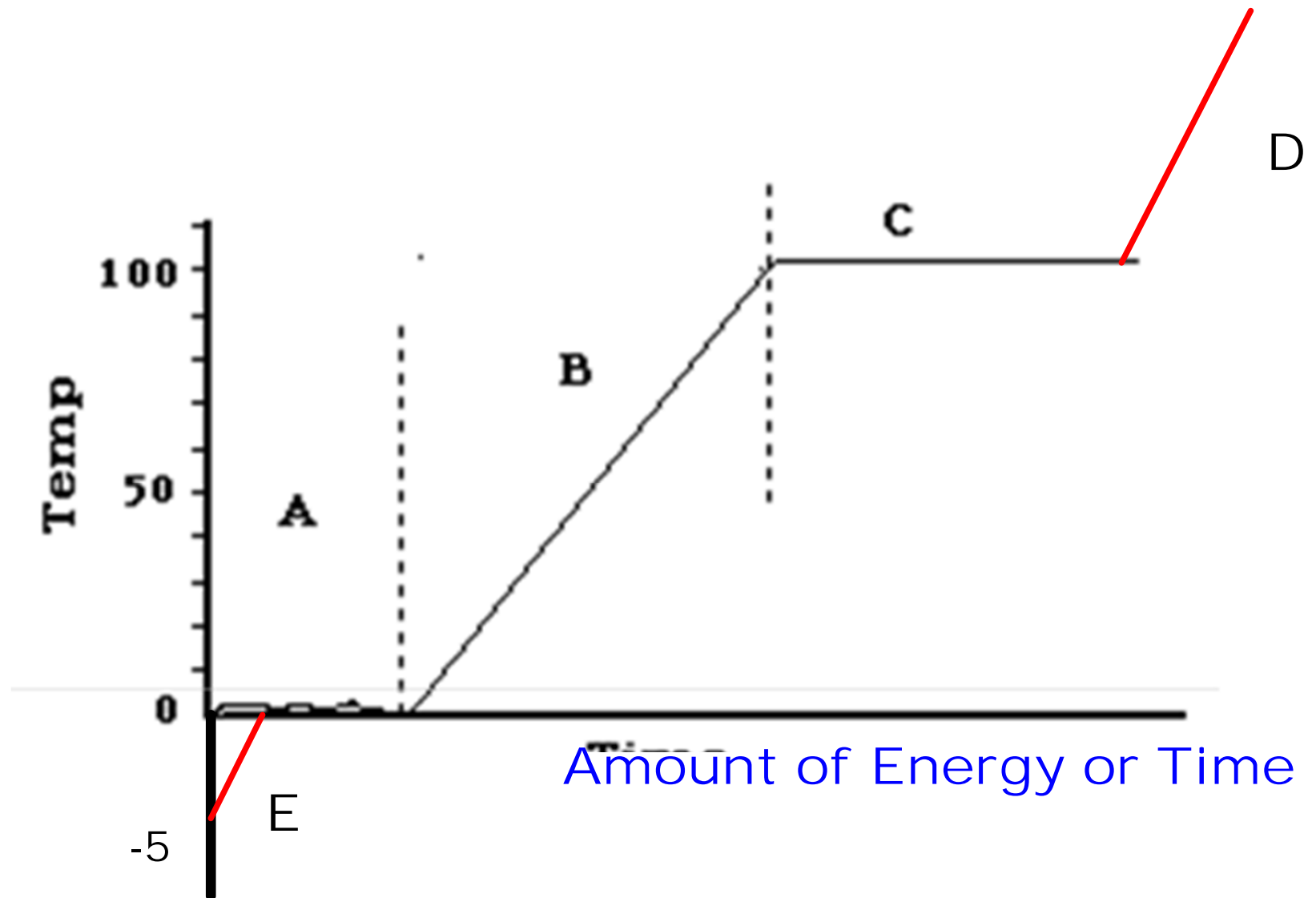
c. C

e. None of the above answers are correct

5, Blue, Icy Hot lab



Heating Curve for Water



- **Energy**

- Think of energy as a quantity that is always involved when there is a *change* in the state of matter. When a substance gets hotter or colder or changes phase, energy is either transferred into or out of the system. The two key ways energy is stored is **thermal** (due to the motion of the particles) and **phase** (due to attractions between the particles).

-

- Remember that attractions *lower* the energy state, so one must *add* energy to a system to pull particles apart. The three ways that energy is transferred is by heating (Q), working (W) and radiating (R); this course focuses on Q.

-

- **Energy**

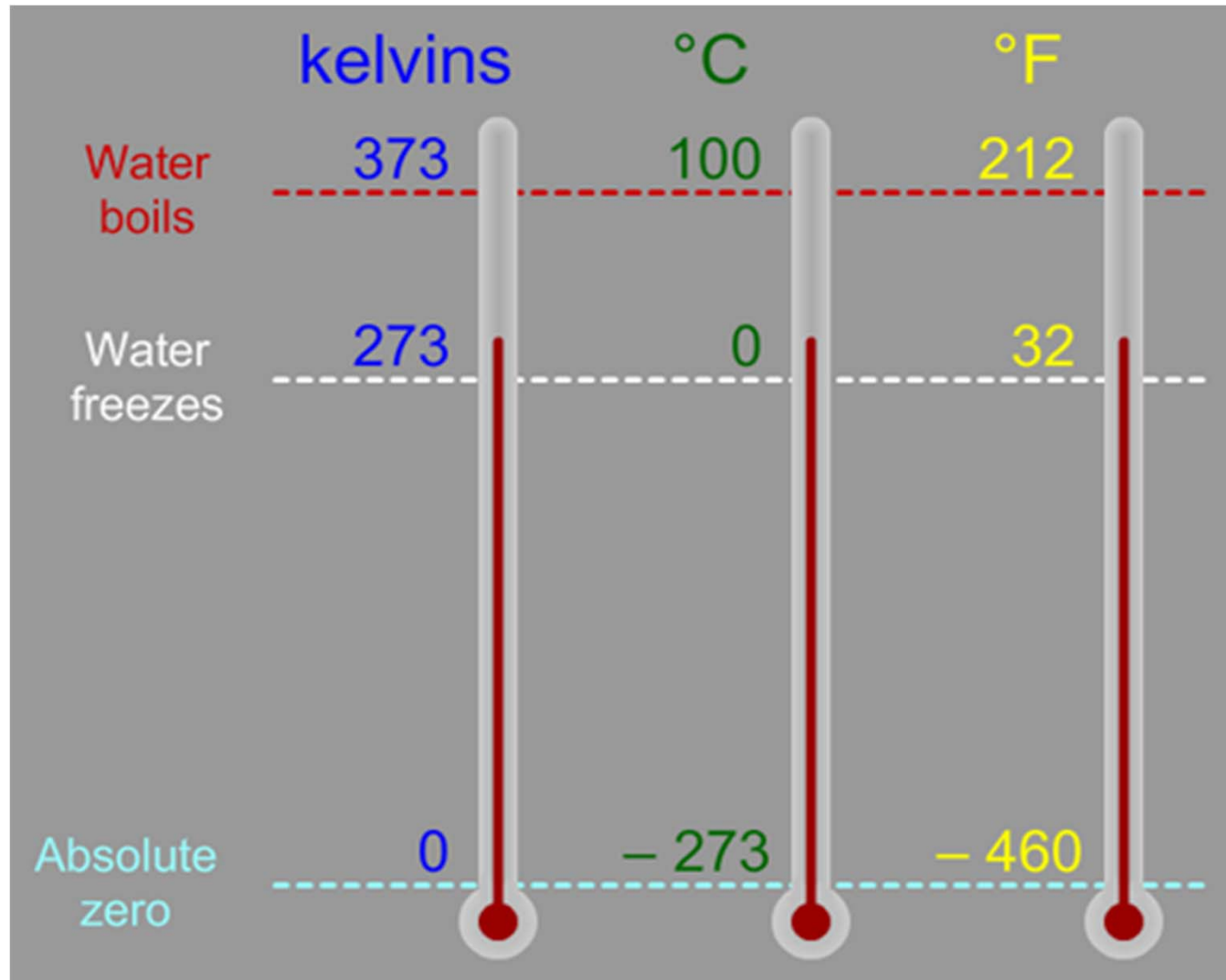
- Think of energy as a quantity that is always involved when there is a *change* in the state of matter. When a substance gets hotter or colder or changes phase, energy is either transferred into or out of the system. The two key ways energy is stored is **thermal** (due to the motion of the particles) and **phase** (due to attractions between the particles).

-

- Remember that attractions *lower* the energy state, so one must *add* energy to a system to pull particles apart. The three ways that energy is transferred is by heating (Q), working (W) and radiating (R); this course focuses on Q.

-

- Energy spontaneously flows from high to low
- Spontaneous – happens without stimulus.
- For heat that means it flows from hot to cold.



Energy (heat) Flow

- Q = heat,
- the circle is the thermometer (the system), the square is the fluid (the surroundings).
- Heat always flows from hot to cold (high to low)

