

Phases

Name - _____

Part 1

1.) Classify each of the following as either a chemical change or a physical change.

- a.) the formation of fog Physical
- b.) burning of marshmallows Chemical
- c.) separating an alcohol-water mixture into water and alcohol Physical
- d.) the rusting of iron Chemical
- e.) mixing yellow and blue paint to make green paint Physical
- f.) the sprouting of a seed Chemical

2.) Describe the changes in particle motion and arrangement for each of the six phase changes.

- a.) Melting - solid = particles touching, highly organized, vibrating, e_{vibe} , and e_{trans} with e_{trans} increasing the most.
- to liquid = particles touching, not organized, sliding past each other with e_{vibe} and e_{trans} , and e_{rot} .
- b.) Freezing - liquid = particles touching, not organized, sliding past each other with e_{vibe} , and e_{trans} , and e_{rot} with e_{trans} decreasing the most.
- to solid = particles touching, highly organized, vibrating, e_{vibe} and e_{trans} .
- c.) Evaporation - liquid = particles touching, not organized, sliding past each other with e_{vibe} , and e_{trans} , and e_{rot} with e_{trans} increasing the most.
- to gas = particles far apart, not organized, bouncing off each other with e_{vibe} , e_{trans} , and e_{rot} .
- d.) Condensation - gas = particles far apart, not organized, bouncing around each other with e_{vibe} , e_{trans} , and e_{rot} , with e_{trans} decreasing the most.
- to liquid = particles touching, not organized, sliding past each other with e_{vibe} , e_{trans} , and e_{rot} .
- e.) Sublimation - solid = particles touching, highly organized, vibrating, e_{vibe} , and e_{trans} with e_{trans} increasing the most.

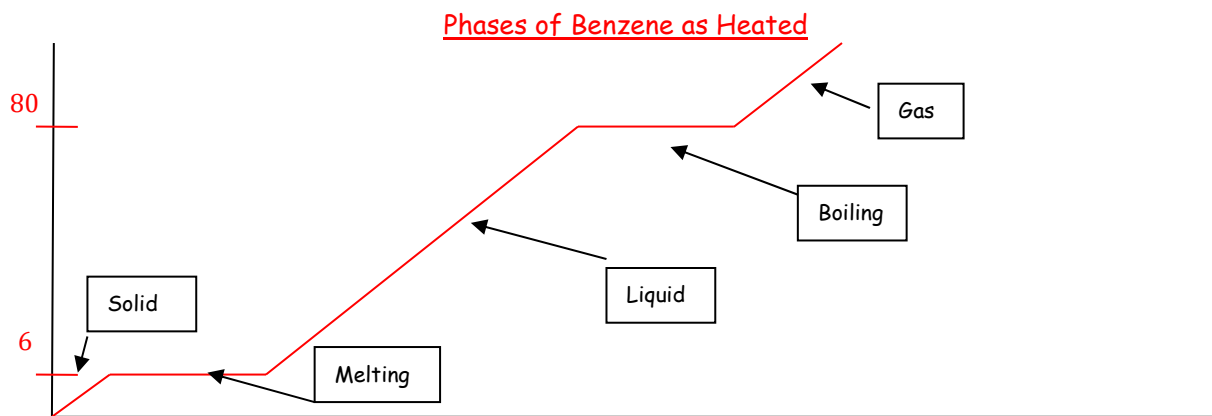
to gas = particles far apart, not organized, bouncing off each other with e_{vibe} , e_{trans} , and e_{rot} .

f.) Deposition - gas = far apart, not organized, bouncing off each other with e_{vibe} , e_{trans} , and e_{rot} with e_{trans} decreasing the most.

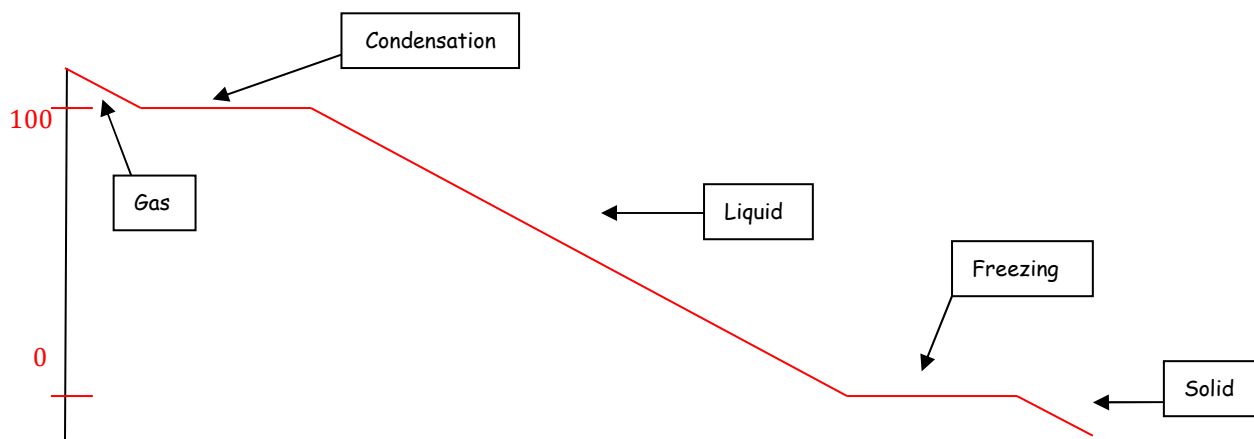
to solid = particles touching, highly organized, vibrating, e_{vibe} , and e_{trans} .

Part 2 - Give the following graphs a meaningful title, label the axes and indicate the phases present on each portion of the graph. No scale needs to be specified for the time axis.

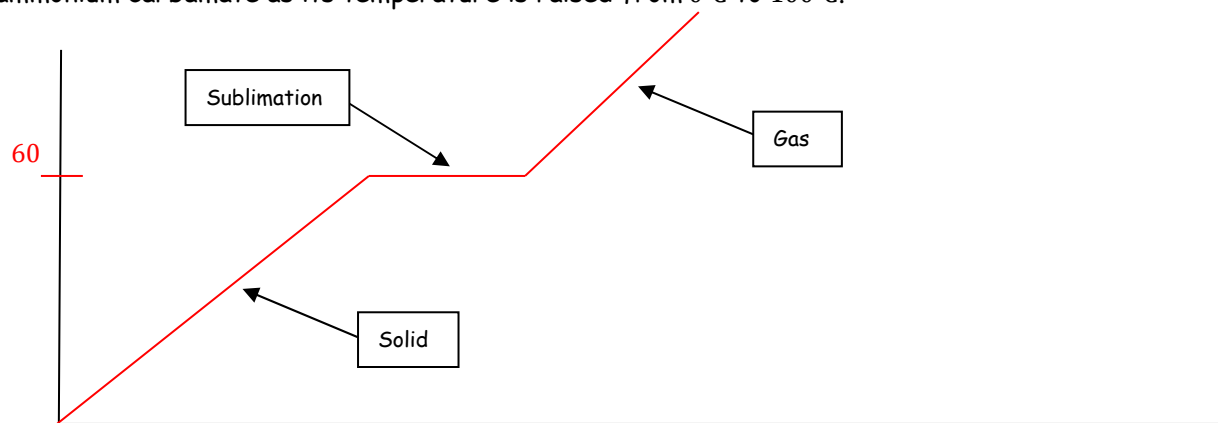
3.) Benzene melts at 6°C and boils at 80°C. Plot a graph showing the temperature vs. time behaviour of benzene as its temperature is raised from 0°C to 100°C.



4.) Water freezes at 0°C and boils at 100°C. Plot a graph showing the temperature vs. time behaviour of steam as its temperature is lowered from 120°C to -20°C.



5.) Ammonium carbamate sublimes at 60°C . Plot a graph showing the temperature vs. time behaviour of ammonium carbamate as its temperature is raised from 0°C to 100°C .



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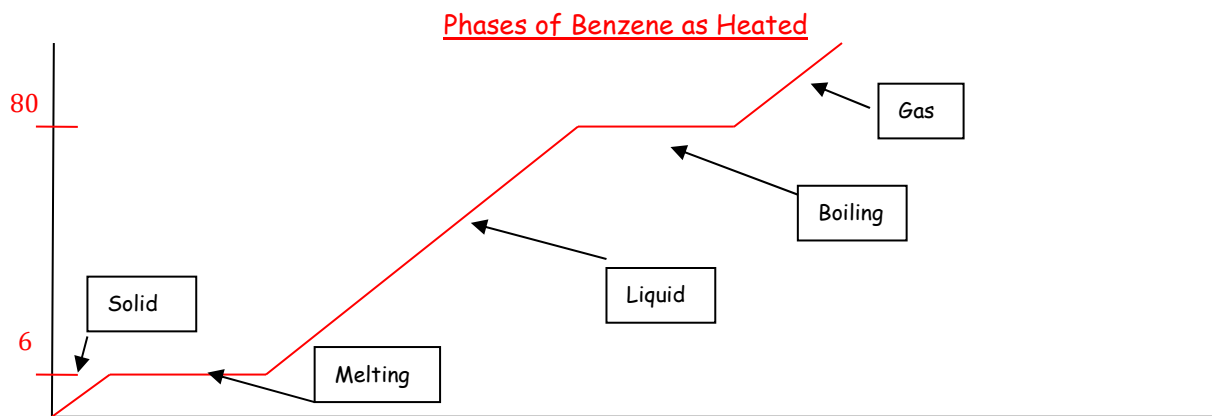
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f.) Deposition - gas = far apart, not organized, bouncing off each other with e_{vibe} , e_{trans} , and e_{rot} with e_{trans} decreasing the most.

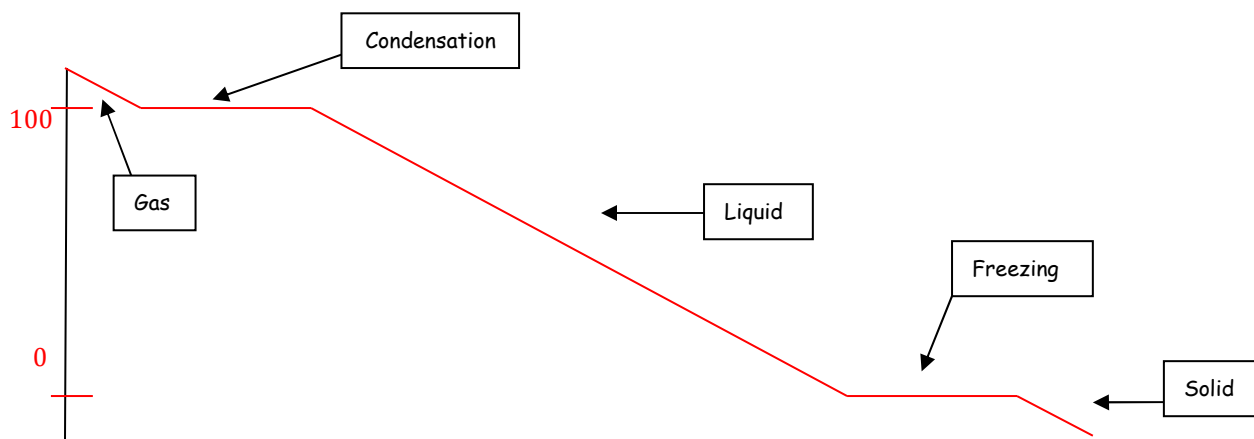
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