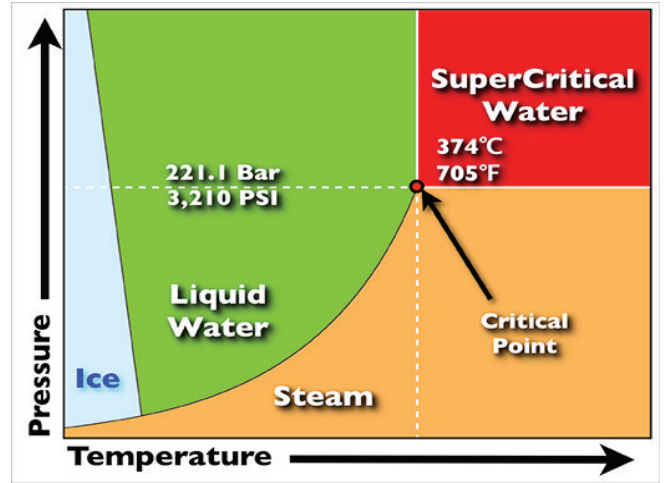
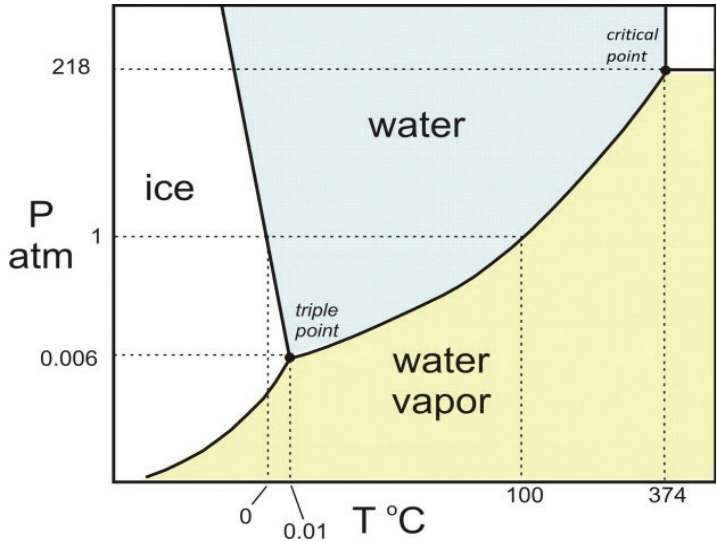
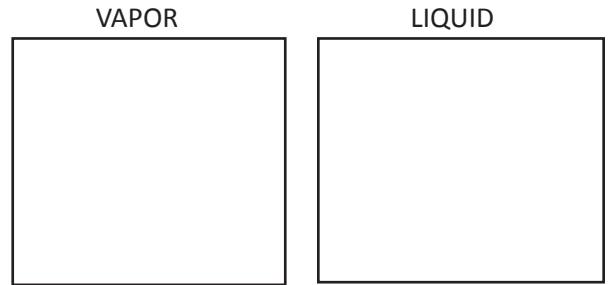


HPT 101: LESSON 2B Supercritical water

PHASE DIAGRAMS summarize what a substance is like at a certain temperatures. This diagram shows us that water goes from liquid to vapor at 100 degrees C under 1 atmosphere pressure. This is what we see when we boil water if we live at, or near, sea level. On top of a high mountain, where pressure is less, water will boil at less than 100 C. The critical point is the point at which increasing either temperature or pressure, or both, will make the water supercritical.



In the supercritical phase, water consists of both vapor and liquid. The vapor is made of individual molecules, or groups of perhaps 2 or 3 molecules. The “liquid” droplets in supercritical water consist of clumps of perhaps 5 to 10 molecules (which are very small compared to what we think of as a droplet of water). Because of the small size of the droplets, if supercritical water is released from its pressurized container, it will be able to cool very quickly--almost instantly (faster than the peas on your plate!).



AN EXTRA SOURCE OF ENERGY IN SCW

The extreme pressure and heat causes the molecules to have an immense amount of motion (kinetic energy). Because of all this motion, the droplets are constantly breaking up and then reforming. The motion also causes water molecules to break apart, leaving broken piece called “ions.”

When these ions get back together they will release energy.

IONIZATION ENERGY

IMPORTANT FACTS ABOUT SUPERCRITICAL WATER (SCW):

- 1) _____
 - 2) _____
 - 3) _____
- A) _____
 - B) _____