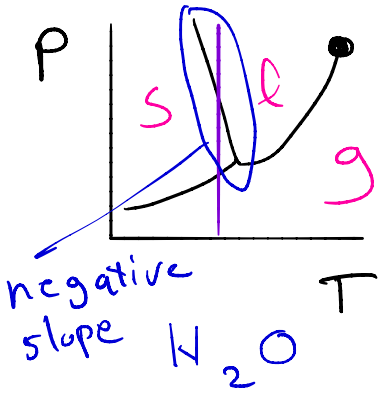
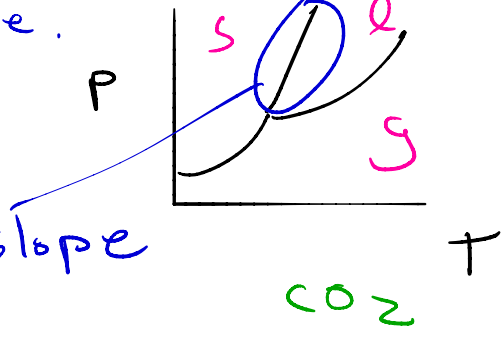
Exam 1: May 4th (Monday)



In water, at a fixed temperature, as pressure is increased, water will first change from a vapor to a solid, then a liquid. This is due to the fact that the IMF in water, combined with water's shape, cause molecules of water to be pulled apart, meaning the solid is less dense than the liquid. When enough pressure is applied, the IMF are overcome, so water turns into a liquid.

In most substances, the solid is more dense.



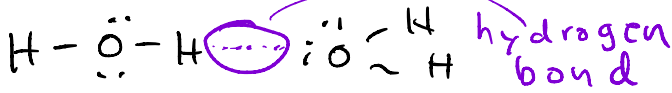
IMF

- The greater the charges involved, the stronger the IMF.

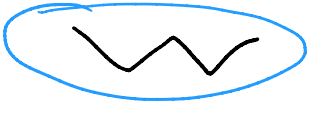
Intermolecular forces involving ions are usually stronger than IMF involving permanent dipoles, which in turn are usually stronger than IMF involving temporary dipoles. p. 485

Hydrogen bonding — these are not the hydrogen bonds

- A dipole-dipole interaction caused whenever a N-H, O-H, or F-H bond is present, This is due to the large EN difference between the atoms in the bonds.



Effect of shape on boiling point



BP = 36.1°C

more dispersion forces

9.5°C

pentane

5 carbons

saturated hydrocarbon

Surface tension

- The ability of a liquid to resist an object breaking through its surface, caused by IMF between molecules at the surface.

Viscocity

- The resistance of a fluid to flowing. Honey, for example, does not flow easily due to the extensive IMF between alcohols in the sugar molecules. Mercury, on the other hand, is much denser but flows more easily.

Since water has very high IMF, it has a high surface tension and an exceptionally high specific heat.

- Real gas law