

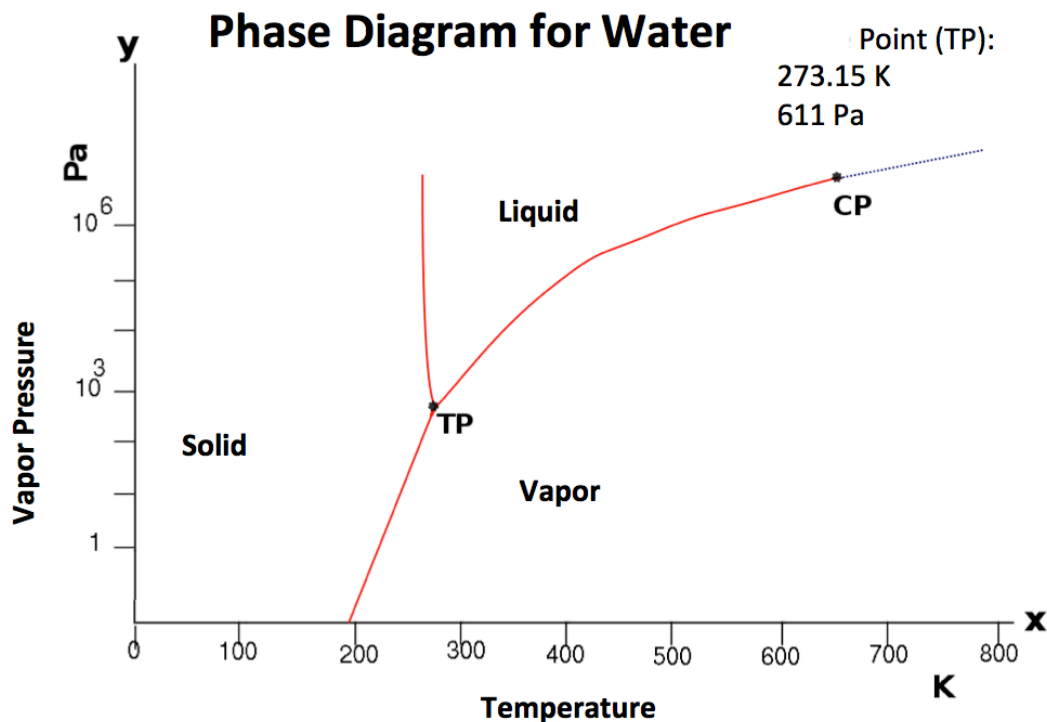
Lab Week 2 – Phase Changes and Water Behavior

Question 1: Liquid, Solid or Vapor?

a) Plot the following on the provided phase diagram using any resources available:

Earth at sea level
Martian surface on the equator during summer
Martian surface at the North Pole during winter
Venus surface

Hint: $P_v = VMR \times P_a$
 P_v = vapor pressure
 VMR = Volumetric Mixing Ratio
(amount of water in atmosphere)
 P_a = atmospheric pressure



b) Based on your calculations, what phases of water are stable on the Earth's surface? Martian surface? Venusian surface?

c) The Phoenix Martian Lander has observed vapor water pressures over 100 times of what is expected from your calculation in part a). Given that information, is liquid water stable on Mars? Why?

d) There has been some recent evidence for flowing liquid water on Mars that quickly disappears. How is liquid water possible given what you know?