Review! (the test is Monday.)

CAeMis+ry: http://genest.weebly.com

Stop in for help every day at lunch and Tues, Weds., & Thurs after school!

After-hours question? Email me at home: eagenest@madison.k12.wi.us

Name ANSWERS

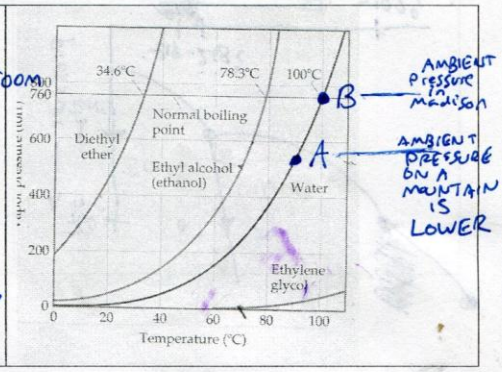
Period

For full credit: 1) you must work where your partner is working
2) Be in your regular desk 6 minutes before the bell for credit check.

1. Write the standard pressure in 101 kPa 760 mmHg

Using the chart at right, answer each:

2. If diethyl ether in this room had a vapor pressure of 600 mmHg would it be boiling? No, because this room is 760 mmHg ambient pressure.
3. How high must the vapor pressure of a substance be at East High School for that substance to boil? At 760 mmHg of vapor pressure the substance will boil.
4. Will the boiling point of a substance be higher on top of a mountain or in Madison? Look at the dots labeled (A)(B) → BOILING PO

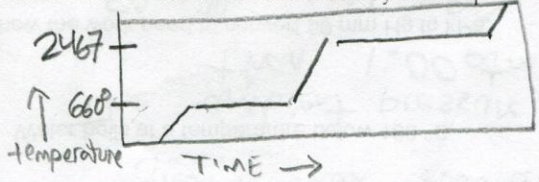


5. Fill in the empty boxes using the vapor pressure from the graph above.

Because the definition of "boiling" is (vapor pressure of liquid) = (ambient pressure)

substance	vapor pressure	the ambient pressure	Is the substance boiling?	temperature
ethyl alcohol	500	500 mmHg	yes	70°C
diethyl ether	400mmHg	400 mmHg	yes	17°C
Ethyl Alcohol	600 mmHg	760 mmHg	no	74 °C
water	200 mmHg	200	yes	64 °C

6. Draw your own heating curve for aluminum, knowing that it melts at 660 °C and vaporizes at 2467 °C Label the x-axis time and label the y-axis temperature.



7. As temperature rises what happens to vapor pressure? VAPOR PRESSURE INCREASES
8. The temperature at which all motion stops is Zero K or -273 °C

9. If the absolute temperature is increased four times higher what happens to the kinetic energy? ~ Kinetic Energy increases by 4×

10. Explain one way each of the following could happen.
   a. Water boils at a temperature above 100 °C.

The ambient pressure must be greater than 1.00 atm. . .

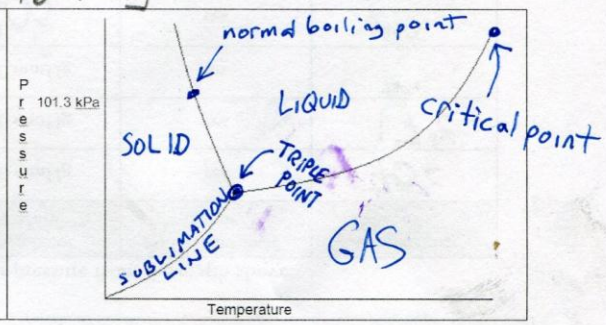
   b. Water boils at a temperature below 100 °C.

The ambient pressure must be less than 1.00 atm

10. Show the work need to convert 50 mm Hg to kPa.

$$50\ mm\ Hg \times \left(\frac{101\ kPa}{760\ mm\ Hg}\right) = 6.6 \approx 7\ kPa$$

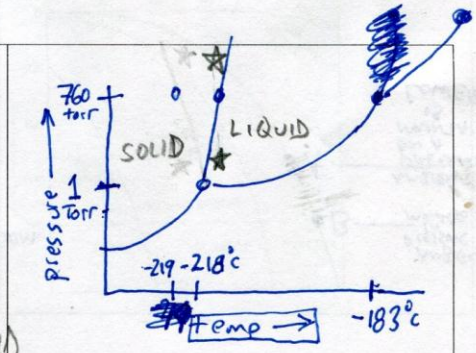
11. The graph below is a phase diagram for substance. Label the following parts on the graph: **sublimation line, normal boiling point, vapor/gas, liquid, solid, triple point, and critical point.**



D

12. The normal melting and boiling points of O_2 are −218°C and −183°C, respectively. Its triple point is at −219°C and 1.14 torr, and its critical point is at −119°C and 49.8 atm. (a) Sketch the phase diagram for O_2, showing the four points given and indicating the area in which each phase is stable. (b) Will $O_2(s)$ float on $O_2(l)$? Explain. (c) As it is heated, will solid O_2 sublime or melt under a pressure of 1 atm?

A B C



Notice that the points "A" and "C" allow us to draw the LIQUID-SOLID BOUNDARY CORRECTLY SLOPED

13. Diamond and graphite are both made out of carbon. Explain how it is possible that one substance is one of the hardest things on Earth while the other breaks on us constantly. The atoms of graphite are in sheets of carbon with not much force holding one sheet to the next. The atoms of diamond are strongly bonded in a 3-dimensional pattern so they are strong in every direction

ANSWER to 12(B) Notice the two ★'s on the graph. At the upper star the substance IS SQUEEZED & denser. The SOLID IS DENSER THAN THE LIQUID

ANSWER to 12(C) THE SOLID WILL SINK IN THE LIQUID

The SOLID WILL MELT.