Recitation Worksheet Two

Name: Key

MyID:

Textbook:
Chemistry & Chemical Reactivity
by John C. Kotz, Paul M. Treichel, John R. Townsend, David Treichel
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Instructions:

- This recitation worksheet covers Ch. 5.3, 11.1, 11.3-11.6, and 12.6
- Please enter your first and last name as it appears on the eLC roster (do not use a nickname that is not reflected in eLC).
- Your UGA myID is a combination of letters and numbers (example: Dr. Abdelrahman's MyID is ema88805@uga.edu). **Do not use your 81x number**.
- Your completed worksheet has to be submitted to **Gradescope**. You have multiple options for submission:
  - You may use an app to annotate the worksheet by placing your answers in the answer boxes and showing your work when appropriate. Afterward, submit the worksheet to Gradescope. You will not need to upload anything to eLC.
  - You may print out the worksheet, write your answers in the answer boxes, and show your work on it when appropriate. Afterward, convert the worksheet to a PDF and submit to Gradescope. You will not need to upload anything to eLC.
  - If you do not have access to a printer, you may type your answers directly into the worksheet PDF and then submit it to Gradescope. Write your work on separate sheets of paper, convert them to a PDF, and upload to the appropriate dropbox on eLC.
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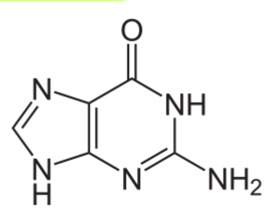
- The following criteria **must** be met to be eligible for full credit:
  - You must make sure the pages are in the correct order and have the same layout as the original worksheet when submitting to Gradescope regardless of your submission type.
  - Answers must be written in the corresponding answer boxes.
  - You must show your work when appropriate.
- This worksheet is due no later than **12:00 PM (noon) on the Saturday, August 31st.**
- A periodic table and formula sheet are attached to the end of this worksheet. Please keep these attached to your worksheet in the correct order when submitting to Gradescope.

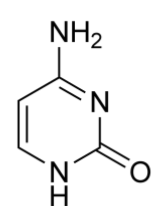
1. Double-stranded DNA consists of nucleobases that tie the DNA strands together. Nucleobases form specific pairs via intermolecular forces, example guanine pairs with cytosine. What is the **major** intermolecular force that exists between guanine and cytosine?

C

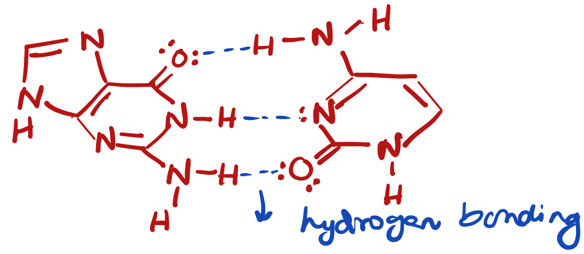
A. London dispersion forces
B. Dipole-dipole forces
C. Hydrogen bonding
D. Ion-dipole forces



Guanine



Cytosine



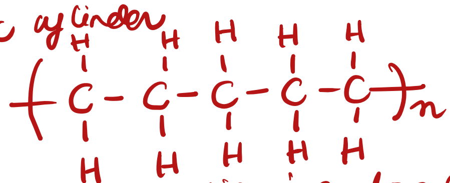
Shape of the meniscus depends on the balance between cohesive & adhesive forces

2. If water is placed in a plastic graduated cylinder, an inverted “U-shaped” meniscus is observed. The reason behind the inverted “U-shaped” meniscus is

A

A. The cohesive forces between the water molecules are stronger than the adhesive forces between the water molecules and the walls of the container
B. The viscosity of the water is greater than the viscosity of the plastic
C. Surface tension of the water prevents it from "beading up" inside the container
D. The molecules of water are forced closer together because of London forces
E. The cohesive forces between the water molecules are weaker than the adhesive forces between the water molecules and the walls of the container

Major IMF is hydrogen bonding



plastic is a long chain hydrocarbon
Major IMF is LDF

Hydrogen bonding (cohesive forces in water) is greater than the adhesive forces between H_2O (H bonding) & plastic container LDF → meniscus acquires inverted = U-shape

3. Which of the choices below from A – E represents the correct order of the compounds below in **order of increasing** viscosity? → viscosity is related to the strength of IMFs
↳ From weakest to strongest IMF

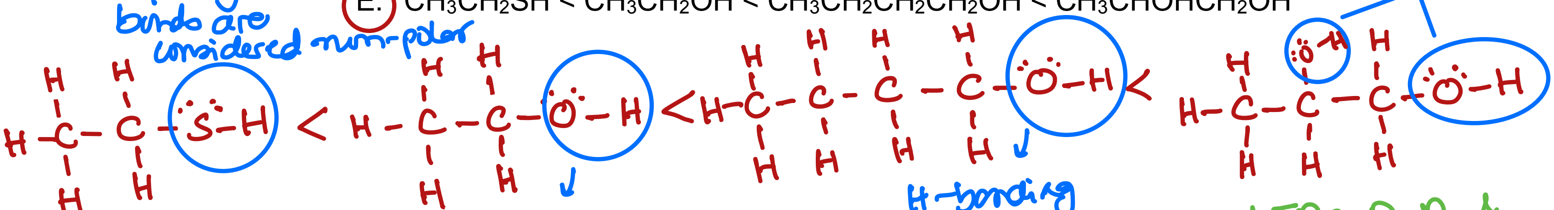
$CH_3CHOHCH_2OH$ CH_3CH_2OH CH_3CH_2SH $CH_3CH_2CH_2CH_2OH$

E

A. $CH_3CHOHCH_2OH < CH_3CH_2OH < CH_3CH_2SH < CH_3CH_2CH_2CH_2OH$
B. $CH_3CH_2CH_2CH_2OH < CH_3CH_2SH < CH_3CH_2OH < CH_3CHOHCH_2OH$
C. $CH_3CHOHCH_2OH < CH_3CH_2CH_2CH_2OH < CH_3CH_2OH < CH_3CH_2SH$
D. $CH_3CH_2OH < CH_3CH_2SH < CH_3CH_2CH_2CH_2OH < CH_3CHOHCH_2OH$
E. $CH_3CH_2SH < CH_3CH_2OH < CH_3CH_2CH_2CH_2OH < CH_3CHOHCH_2OH$

sulfur-hydrogen bonds are considered non-polar

Can form twice the number of H-bond



LDFs only

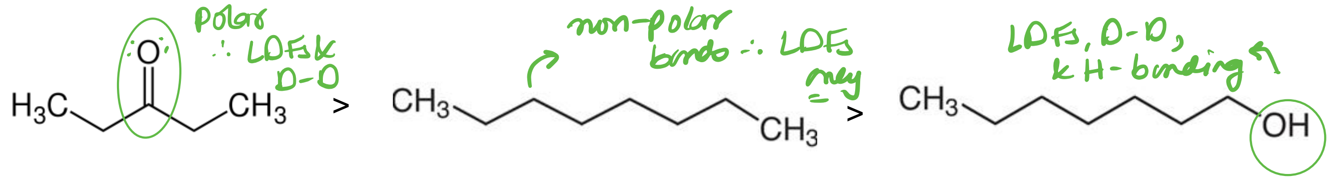
LFDs, D-D, & H-bonding

LFDs, D-D, & H-bonding (has more viscosity because of longer C-H chain ∴ ↑ LDFs)

LFDs, D-D, & H-bonding

vapor pressure is related to the strength of IMFs
the stronger the IMFs the lower the vapor pressure & vice versa

4. At room temperature, the vapor pressure pattern is pentanone > octane > heptanol. Which one of the following statements is **FALSE**?



Pentanone
Molar mass = 86.13 g/mol

Octane
Molar mass = 114.23 g/mol

Heptanol
Molar mass = 116.20 g/mol

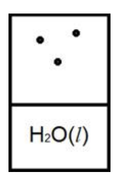
E

A. A substance with higher vapor pressure is held together by weaker binding forces ✓
B. Heptanol has the lowest vapor pressure and strongest intermolecular force due to hydrogen bonding ✓
C. Octane has lower vapor pressure than pentanone due to London dispersion forces ✓
D. Heptanol would have a higher boiling point than octane ✓
E. Pentanone would have a higher boiling point than octane X

* Note that pentanone has a higher vapor pressure than octane although pentanone has dipole-dipole forces. When sizes of molecules are different, LDFs are more significant than D-D forces

Pentanone has a higher vapor pressure than octane ∴ it will have a lower boiling point

5. Below is a representation of liquid water in equilibrium with its water vapor in a rigid container at 20.0 °C. The circles represent water vapor. (One dot = 100 mm Hg)



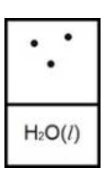
→ if one dot = 100 mmHg
∴ 3 dots = 300 mmHg → P_1
20.0°C + 273.15 = 293.15 K → T_1

Which diagram below best represents liquid water in equilibrium with its water vapor at 32.7 °C? The heat of vaporization of water is 40.7 kJ/mol.

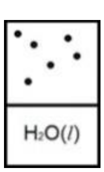
You can determine the vapor pressure at this temperature using the Clausius-Clapeyron equation

B

A.



B.

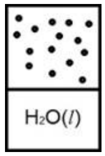


$$\ln\left(\frac{P_2}{P_1}\right) = \frac{\Delta H_{vap}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

P_1 = 300 mm Hg
T_1 = 293.15 K
T_2 = 32.7°C + 273.15 = 305.85 K

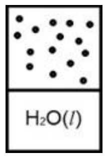
P_2 = ?
ΔH_{vap} = 40.7 kJ/mol or 4.07×10^4 J/mol
R = 8.314 J/mol·K

C.



$$\ln\left(\frac{P_2}{300}\right) = \frac{4.07\times10^4 \frac{J}{mol}}{8.314 \frac{J}{mol \cdot K}}\left(\frac{1}{293.15} - \frac{1}{305.85}\right)\frac{1}{K}$$

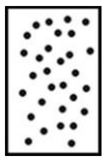
D.



$$\ln\left(\frac{P_2}{300}\right) = 0.6931778$$

$$\frac{P_2}{300} = e^{0.6931778}$$

E.



$$\frac{P_2}{300} = 2.000524508$$

$$\therefore P_2 = 600.1573524 \approx 600.\ mmHg$$

$$\frac{\text{one dot}}{100\ \cancel{mmHg}} \times 600.\ \cancel{mmHg} = \underline{6}\ \text{dots}$$ represents the new vapor pressure at 32.7°C

6. A vapor volume of 1.17 L forms when a sample of liquid acetonitrile, CH_3CN absorbs 1.00 kJ of heat at its normal boiling point (81.6 °C and 1.00 atm). What is ΔH_{vap} in kJ/mol of CH_3CN? (**Hint:** you can use the ideal gas law to solve this problem).

24.9	kJ/mol

① Determine the number of moles using the ideal gas law

$PV = nRT$ (ideal gas law)

$P = 1.00\ atm$

$V = 1.17 L$

$n = ?$

$R = 0.08206 \frac{L \cdot atm}{mol \cdot K}$

$T = 81.6°C + 273.15 = 354.75\ K$

$$\therefore n = \frac{1.00\ \cancel{atm} \times 1.17\ \cancel{L}}{0.08206 \frac{\cancel{L}\cdot \cancel{atm}}{mol \cdot \cancel{K}} \times 354.75\ \cancel{K}} = 0.04018\ mol$$

② $$\Delta H_{vap} = \frac{1.00\ kJ}{0.04018\ mol} = 24.88 \sim 24.9\ kJ/mol$$

7. For a particular liquid, raising its temperature from 25 °C to 45 °C causes its vapor pressure to double. What is the enthalpy of vaporization of this liquid?

C

A. 115 kJ/mol
B. 288 kJ/mol
C. 27.3 kJ/mol
D. 2.53 kJ/mol
E. 270. kJ/mol

$T_1 = 25 + 273.15 = 298.15$

$T_2 = 45 + 273.15 = 318.15$

Increasing the temperature from T_1 to T_2 doubles the vapor pressure ∴ you can assume that $\frac{P_2}{P_1} = \frac{2}{1}$

Using Clausius-Clapeyron equation:

$$\ln\left(\frac{P_2}{P_1}\right) = \frac{\Delta H_{vap}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

$$\ln\left(\frac{2}{1}\right) = \frac{\Delta H_{vap}}{8.314\ J/mol\cdot K}\left(\frac{1}{298.15} - \frac{1}{318.15}\right)$$

$3.353\times10^{-3} - 3.1427\times10^{-3} = 2.108\times10^{-4}$

$$\Delta H_{vap} = 2.733206123\times10^{4} J \times \frac{1\,kJ}{1000\,J}$$

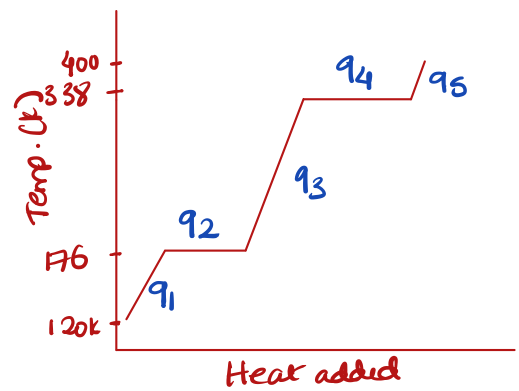
$$= 27.3\ \frac{kJ}{mol}$$

8. What quantity of energy in kJ does it take to convert 0.250 kg of solid methanol (CH_3OH) at 120 K to gaseous methanol at 400 K? **Do not use scientific notation**.

464

kJ

Melting point	176 K
Boiling point	338 K
Heat of fusion	2.2 kJ/mol
Heat of vaporization	35.2 kJ/mol
Specific heat (solid)	105 J/mol·K
Specific heat (liquid)	81.3 J/mol·K
Specific heat (gas)	48.0 J/mol·K



$$q_1 = m\cdot C\cdot \Delta T = \overset{2.50\times10^2}{\cancel{g}} \times \frac{1\,\cancel{mol}}{32.04\,\cancel{g}} \times \frac{105\,J}{\cancel{mol}\cdot\cancel{K}} \times \overset{56.0}{(176.0-120.0)\cancel{K}} = 4.58801\times10^4 J = 45.8801\ kJ$$

$$q_2 = n \times \Delta H_{fus} = 2.50\times10^2\cancel{g} \times \frac{1\,\cancel{mol}}{32.04\,\cancel{g}} \times 2.2\frac{kJ}{\cancel{mol}} = 17.1660\ kJ$$

$$q_3 = m\cdot C\cdot\Delta T = 2.50\times10^2\cancel{g} \times \frac{1\,\cancel{mol}}{32.04\,\cancel{g}} \times 81.3\frac{J}{\cancel{mol}\cdot\cancel{K}}\overset{162.0}{(338.0-176.0)\cancel{K}} = 102.7669\ kJ$$

$$q_4 = n \times \Delta H_{vap} = 2.50\times10^2\cancel{g} \times \frac{1\,\cancel{mol}}{32.04\,\cancel{g}} \times 35.2\frac{kJ}{\cancel{mol}} = 274.6567\ kJ$$

$q_5 = m \cdot C \cdot \Delta T = 2.50 \times 10^2 \cancel{g} \times \frac{1\ \cancel{mol}}{32.04\ \cancel{g}} \times 48.0 \frac{J}{\cancel{mol \cdot K}} \times (400.0 - 338.0)\cancel{K} = 23.2331$ kJ

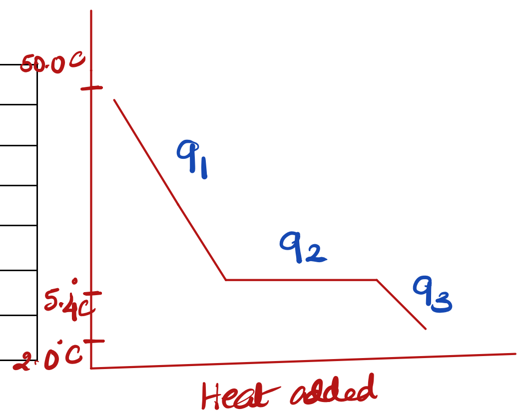
$Q_{Total} = q_1 + q_2 + q_3 + q_4 + q_5 = (45.8801 + 17.1660 + 102.7669 + 274.6667 + 23.2331) = 463.7021$ kJ

≈ 464 kJ

9. If 15.7 g of benzene (C_6H_6) in the liquid phase at 50.0 °C is converted to solid benzene at 2.0 °C, calculate ΔH_{sys}. Assume that the pressure is constant during the process.

$\boxed{-3.3}$ kJ

Melting point	5.4 °C
Boiling point	90.1 °C
Heat of fusion	9.9 kJ/mol
Heat of vaporization	30.7 kJ/mol
Specific heat (solid)	1.51 J/g·°C
Specific heat (liquid)	1.80 J/g·°C
Specific heat (gas)	1.92 J/g·°C



$q_1 = m \cdot C \cdot \Delta T = 15.7\ g \times 1.80 \frac{J}{g \cdot °C} \times (\underbrace{5.4 - 50.0}_{-4.4})°C = -1.2603$ kJ

$q_2 = n \times \Delta H_{fus} = 15.7\ g \times \frac{1\ mol}{78.11\ g} \times -9.9 \frac{kJ}{mol} = -1.9899$ kJ

$q_3 = m \cdot C \cdot \Delta T = 15.7\ g \times 1.51 \frac{J}{g \cdot °C} \times (\underbrace{2.0 - 5.4}_{-3.4})°C = -0.08060$ kJ

$\Delta H_{sys} = q_{total} = (-1.2603) + (-1.9899) + (-0.08060\ kJ)$

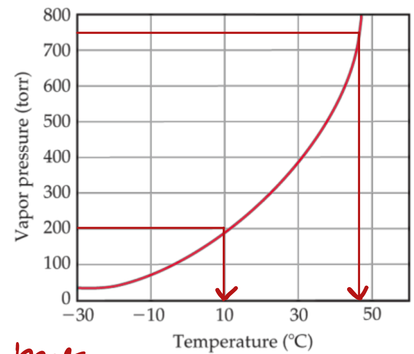
$= -3.33$ kJ ≈ -3.3 kJ

At constant pressure

$\Delta H = q$

A volatile liquid is a liquid that can evaporate easily ∴ it has a high vapor pressure

10. The graph shown to the right represents the vapor pressure of CS_2, a volatile liquid. Which of the following statements regarding CS_2 is true? Select all that apply.



ABD

S = C = S linear ∴ non-polar (LDFs)

A. CS_2 has weaker intermolecular forces compared to water
B. The vapor pressure of CS_2 is greater than the vapor pressure of water weaker IMF = higher vapor pressure
C. The normal boiling point of CS_2 is approximately 30 °C
D. The vapor pressure of CS_2 is 200 torr at 10 °C

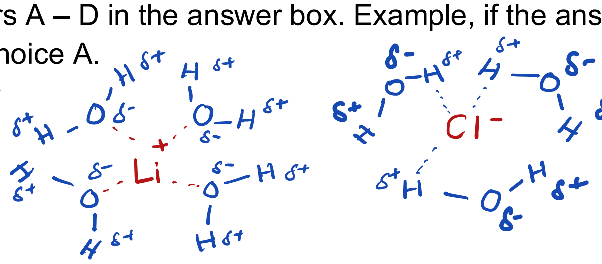
H–O–H bent
polar structure
H-bonding is the major IMF

11. Indicate the **most significant** intermolecular force in each of the compounds or compound pairs below. For each molecule select one of the following choices:
A. London dispersion forces
B. Dipole-dipole forces
C. Hydrogen bond
D. Ion-dipole forces

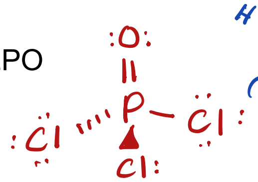
For your answer choice insert the letters A – D in the answer box. Example, if the answer is London dispersion forces, then the answer is choice A.

D — i. LiCl (in water)

ionic compound

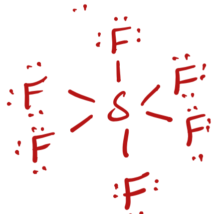


B — ii. Cl_3PO



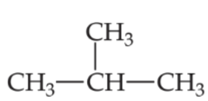
although tetrahedral, the presence of oxygen breaks the symmetry of the molecule

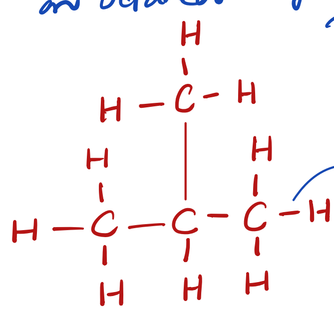
A — iii. SF_6



Sulfur-hydrogen bonds are polar but SF_6 has an octahedral geometry resulting in a non-polar molecule

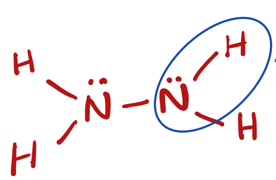
A — iv.





this compound has only C–H bonds which are non-polar ∴ the only type of IMF that exist is Dispersion forces

C — v. H_2NNH_2



hydrogen is covalently bonded to nitrogen (one of the three most electronegative atoms) ∴ can form hydrogen bonds.

12. Which of the following choices A – E represents the correct order of the compounds below in order of **decreasing** vapor pressure?

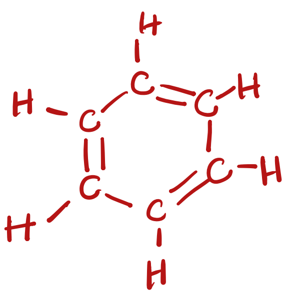
↳ vapor pressure is related to the strength of IMFs. the stronger the IMFs the lower the vapor pressure & vice versa

E

$C_6H_5CH_3$ $C_6H_5NH_2$ C_6H_6

A. $C_6H_6 > C_6H_5NH_2 > C_6H_5CH_3$
B. $C_6H_5NH_2 > C_6H_5CH_3 > C_6H_6$
C. $C_6H_5CH_3 > C_6H_6 > C_6H_5NH_2$
D. $C_6H_5NH_2 > C_6H_6 > C_6H_5CH_3$
E. $C_6H_6 > C_6H_5CH_3 > C_6H_5NH_2$
F. $C_6H_5CH_3 > C_6H_5NH_2 > C_6H_6$

capable of forming H-bonding



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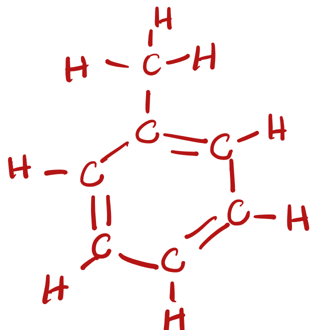

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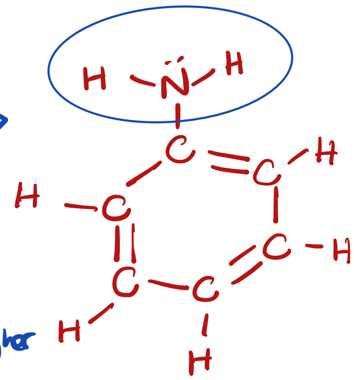


LOFs

Highest vapor pressure due to weakest IMF (LOFs)

LOFs but has a slightly higher molar mass than C_6H_6 (heavier) ∴ stronger LOFs and lower vapor pressure

LOF, D-D, hydrogen bonding

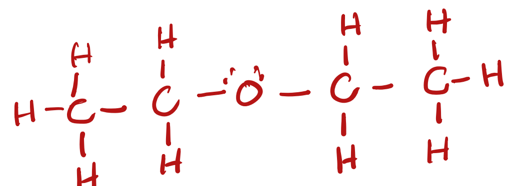
Lowest vapor pressure due to strongest IMF (H-bonding)

13. Which of the following compound has the **highest** surface tension?

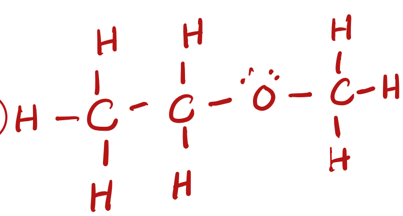
↳ related to strength of IMFs

E

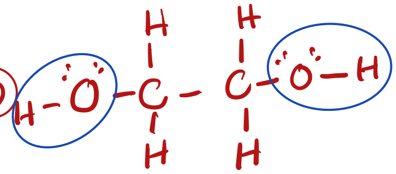
A. $CH_3CH_2OCH_2CH_3$
B. $CH_3CH_2OCH_3$
C. $CH_3CH_2CH_2CH_3$
D. $OHCH_2CH_2OH$
E. $CH_2OHCHOHCH_2OH$

A 

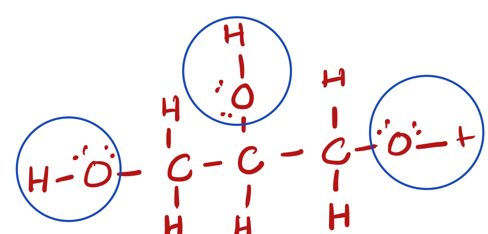
Polar
LOF, D-D

B 

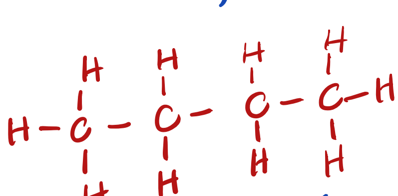
Polar
LOF & D-D

D 

LOF, D-D, H-bonding

E 

LOF, D-D, H-bonding

C 

Non-polar
LOF only

14. Which statements about vapor pressure below are true? Select all that apply.

BC

A. Water in a 150 mL volume container with a diameter of 12 cm has a higher vapor pressure compared to water in a container with a volume of 75 mL and a diameter of 5.5 cm
B. The stronger the intermolecular forces between the molecules of a liquid the lower the vapor pressure
C. An increase in temperature of a liquid increases its vapor pressure
D. Normal melting point is the temperature at which the vapor pressure of a liquid is 760 torr or 1 atm.

A False: vapor pressure doesnot change with the volume of the container

B true: Vapor pressure is inversely related to IMFs. The stronger the IMF the lower the vapor pressure because more energy is required to overcome the IMF between molecules to go from the surface of the liquid to the vapor phase

C True: with an increase in temperature there is an increase in the energy supplied to overcome the IMF between the molecules & they can go from liquid to vapor phase ∴ ↑ in vapor pressure

D Normal boiling point is the temperature at which the vapor pressure of a liquid is 760 torr or 1 atm

15. A liquid has an enthalpy of vaporization of 30.8 kJ/mol. At 273 K it has a vapor pressure of 102 mmHg. What is the normal boiling point of this liquid? (1mm Hg = 1 Torr)

B

A. 273 K
B. 320. K
C. 292 K
D. 238 K
E. 257 K

Using Clausius-Clapeyron Equation:

1 $\ln\left(\frac{P_2}{P_1}\right) = \frac{\Delta H_{vap}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$

$\Delta H_{vap} = 30.8$ kJ/mol
$R = 8.314$ J/mol·K
$P_1 = 102$ mmHg
$T_1 = 273$ K
$P_2 = 760$ mmHg
$T_2 = ?$

2 $\ln\left(\frac{760}{102}\right) = \frac{3.08 \times 10^4 \, \frac{J}{mol}}{8.314 \, J/mol \cdot K}\left(\frac{1}{273} - \frac{1}{T_2}\right)$

3 sig figs

exact

2.00834562

$= 5.4212290 \times 10^{-4}\left(\frac{1}{273} - \frac{1}{T_2}\right)$

$0.54212290 \times 10^{-3} = 3.663003663 \times 10^{-3} - \frac{1}{T_2}$

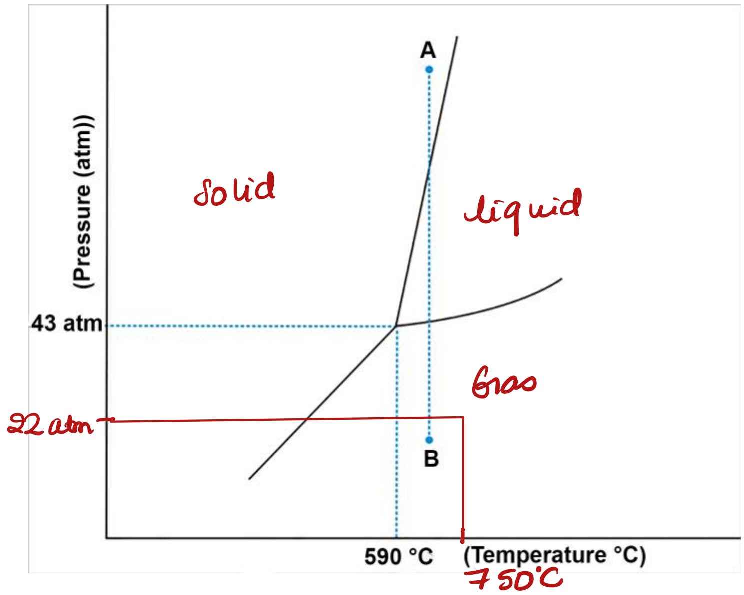
$\frac{1}{T_2} = 3.120880758 \times 10^{-3}$

$\frac{1}{T_2} = 3.120880758 \times 10^{-3}$

$\therefore T_2 = 320.42$
≈ 320 K

$\therefore T_2 = 320.4223671$ K

16. Using the phase diagram for phosphorous below, which of the following statements is correct? Select all that apply. Insert letters without spaces or commas, example: **ABCD**.

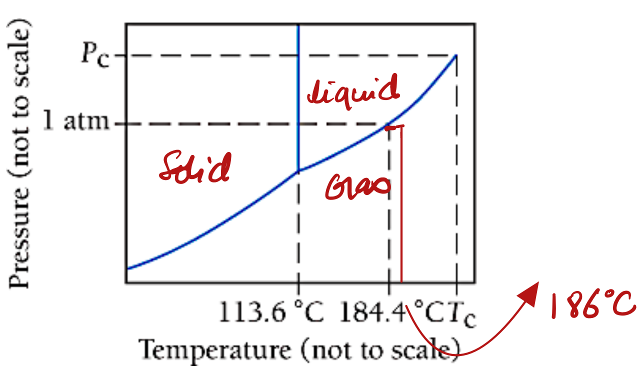


this is the triple point

BCE

A. The critical pressure and temperature of phosphorous is at 43 atm and 590 °C respectively
B. The triple point of phosphorous is at 43 atm and 590 °C
C. Phosphorous changes from solid to liquid to gas as you follow along the line AB
D. Phosphorous changes from liquid to gas to solid as you follow along the line AB
E. Phosphorous exists as a gas if it is heated at 22 atm and 750 °C

17. Using the phase diagram for iodine below, answer the following questions:



A. What is the normal boiling point for iodine?

184.4 °C

temperature at which vapor pressure = 1 atm
You can determine that from the vaporization curve

B. What is the normal melting point for iodine?

$\boxed{113.6}$ °C ↓ temperature at which liquid & solid phase are at equilibrium at 1atm

C. Which physical state is present at 186 °C and 1.0 atm? (Insert: solid, liquid, or gas).

$\boxed{\text{Gas}}$

Extra Practice Questions: these questions will not be graded.

1. You purchase a new pressure cooker, and the instruction booklet specifies that the "highest setting" is 0.745 atm. You already know that standard atmospheric pressure is 1.00 atm, so the instruction booklet must mean 0.745 atm above atmospheric pressure. At what temperature in degree Celsius will water boil in this pressure cooker if it is programmed on the highest setting? (ΔH_{vap} for water = 40.7 kJ/mol)

$\boxed{117}$ °C

Using the Clausius Clapeyron equation

$P_1 = 1.745$ atm

$P_2 = 1.00$ atm

$T_1 = ?$

$T_2 = 100. + 273.15 = 373.15$

$\Delta H_{vap} = 40.7 \times 10^3$ J/mol

$R = 8.314$ J/mol.K

$$\ln\left(\frac{P_2}{P_1}\right) = \frac{\Delta H_{vap}}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

3 sig fig

$$\ln\left(\frac{1.00}{1.745}\right) = \frac{40.7 \times 10^3 \text{ J}}{8.314 \frac{\text{J}}{\text{mol.K}}}\left(\frac{1}{T_1} - \frac{1}{373.15}\right)$$

3 sig fig

$-5.56754556 \times 10^{-1}$

$$-1.137314 \times 10^{-4} = \frac{1}{T_1} - 2.680965147 \times 10^{-3}$$

$$\frac{1}{T_1} = 2.567234007 \times 10^{-3}$$

$$\therefore T_1 = 389.6878759 \text{ K} - 273.15$$

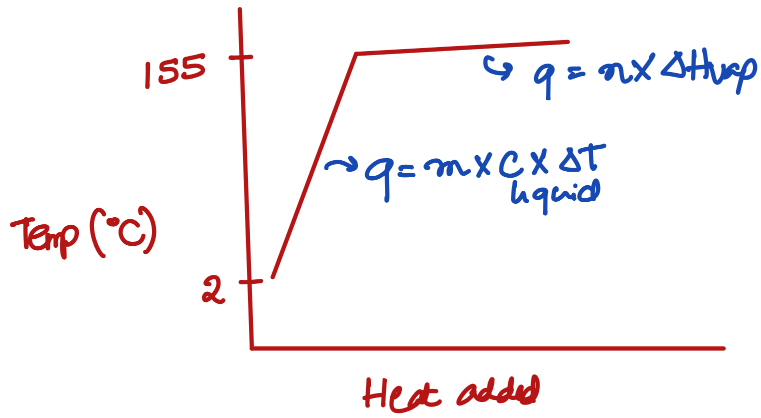
$$= 116.5378759$$

$$\approx 117 °C$$

2. A hypothetical substance “Honorium” has a melting point of −10.0 °C and a boiling point of 155 °C. If the “Honorium” is heated from 2 °C to the gas phase at 155 °C, which of these would be used to calculate the total heat added?

$\boxed{D}$

i. Specific heat of the solid phase
ii. Heat of fusion
iii. Specific heat of the liquid phase
iv. Heat of vaporization
v. Specific heat of the gas phase



A. i, ii, iii, iv, and v

B. i and ii only

C. iii, iv, and v

D. iii and iv only

E. ii, iii, and iv

F. ii and iii only

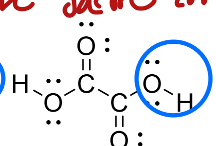
Remember: to form a H-bond, hydrogen must be covalently bonded to O, N, F

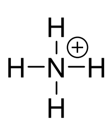
3. Which of the following pure substances would be capable of hydrogen bonding? Select all that apply.

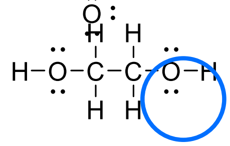
↳ Note that the substance should form H-bonding with the same molecule

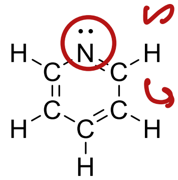
$\boxed{BDG}$

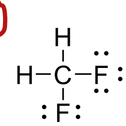
~~A.~~ H_2 H−H (non-polar)

B.  → hydrogen is covalently bonded to oxygen

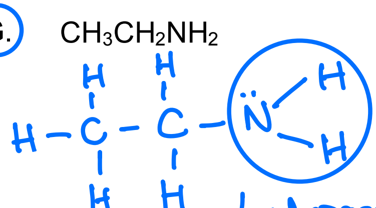
~~C.~~  if another NH_4^+ ion exists, there is no lone-pair to accept H-bonding

D.  → hydrogen is covalently bonded to oxygen

~~E.~~  ↳ No hydrogen covalently bonded

~~F.~~  → hydrogen is not directly bonded to fluorine

G. $CH_3CH_2NH_2$



hydrogen is covalently bonded to nitrogen

~~H.~~ NaOH → ionic compound

Na^+ OH^-

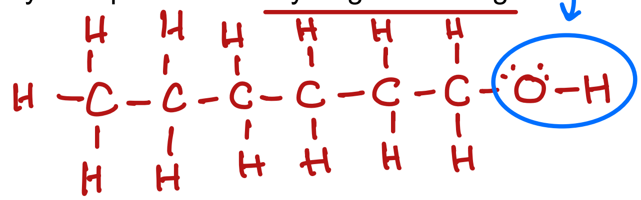
↑ Physical properties such as boiling points can help us predict the type of IMFs. the ↑ boiling point ∴ ↑ IMFs

4. The molar mass and boiling point of three compounds is provided in the table below. Answer the questions based on the tabulated data.

	Compound	Molar Mass (g/mol)	Boiling Point (°C)	
A.	2-hexanone	100.16	128	
B.	heptane	100.20	98	→ lowest boiling point
C.	1-hexanol	102.17	156	→ highest boiling point

I. Which compound do you expect to form hydrogen bonding?

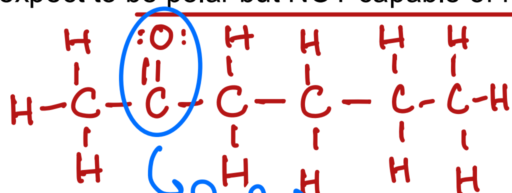
$\boxed{C}$



1-hexanol highest boiling point

II. Which compound do you expect to be polar but NOT capable of forming hydrogen bonding?

$\boxed{A}$

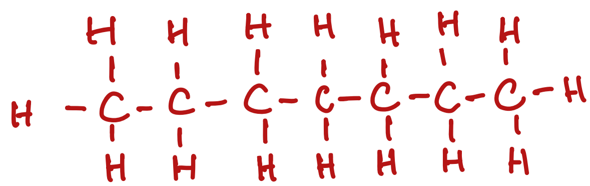


D-D forces

Boiling point is lower compared to 1-hexanol (C)

III. Which compound do you expect to be neither polar nor capable of forming hydrogen bonding?

$\boxed{B}$



LDFs only ∴ lower boiling point

5. If you have a closed container with a liquid and the liquid is heated, which of the following you would not expect to happen?

$\boxed{C}$

~~A.~~ The molecules of the liquid and vapor phase move faster True Kinetic energy of the molecule increases

~~B.~~ The vapor pressure increases with temperature True

C. The densities of the liquid and vapor phase become the same False

~~D.~~ The molecules in the vapor phase and the surface of the liquid phase are in dynamic equilibrium Closed - True

~~E.~~ The liquid will boil at its boiling point True