

## PRACTICE PROBLEMS UNIT 2

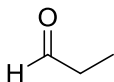
**2A. Identify if one or more of the following functional groups are present in a molecule: (alkane), alkene, alkyne, aromatic, alkyl halide, alcohol, ether, amine, aldehyde, ketone, carboxylic acid**

2A.1 Indicate all functional groups present in the following molecules.

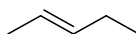
a)



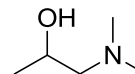
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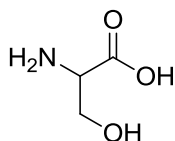
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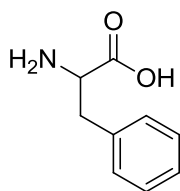
d)



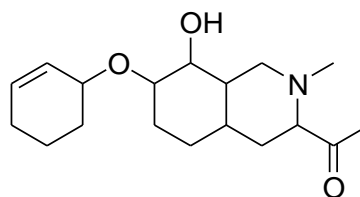
e)



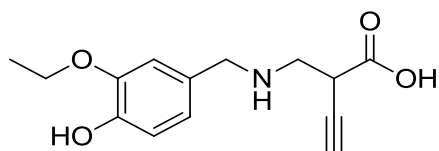
f)



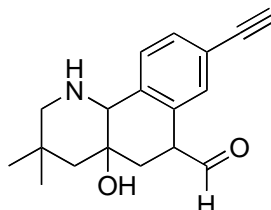
g)



h)



i)

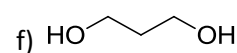
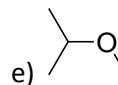
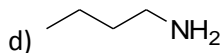
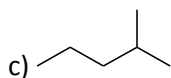


**2B. Determine the type of IMFs present in a molecule (dispersion, dipole-dipole, and hydrogen bonding forces)**

2B.1 Which type of IMFs are present for each compound?

a)  $\text{CO}_2$

b)  $\text{CH}_2\text{Cl}_2$



**2C. Determine relative boiling and melting points of compounds based on structure and IMFs**

2C.1 Predict which compound in each pair has the highest boiling point.

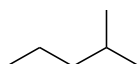
a)  $\text{Br}_2$     $\text{Cl}_2$

b)  $\text{CH}_3\text{OH}$     $\text{CH}_3\text{F}$

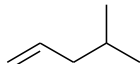
c)  $\text{CH}_3\text{CH}_3$     $\text{CH}_3\text{CH}_2\text{CH}_3$

d)  $\text{H}_2\text{O}$     $\text{H}_2\text{S}$

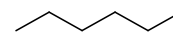
e)



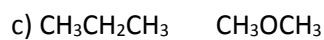
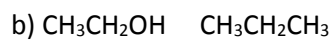
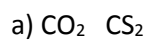
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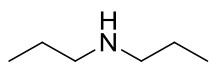
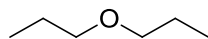
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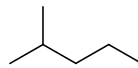
2C.2 Predict which compound of each pair would have the highest melting point.



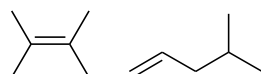
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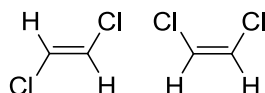
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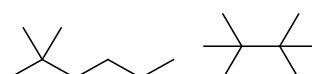
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g)

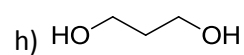
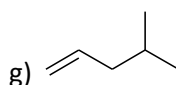
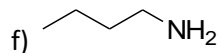
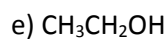
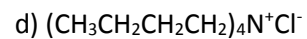
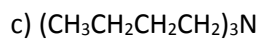
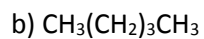
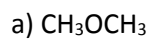


h)

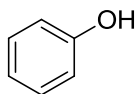


2D. Determine the likely solubility of a molecule based on structure (hydrophobic/ hydrophilic). Use the hydrophobic effect to explain the structure and properties of soap and cell membranes

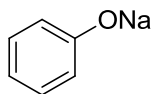
2D.1 Predict if the following compounds are water soluble.



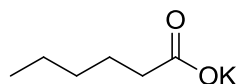
i)



j)



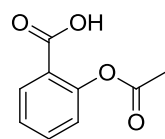
k)



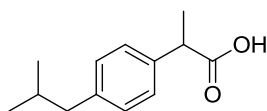
l)



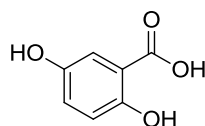
2D.2 Rank the following in order of increasing solubility in water



Aspirin



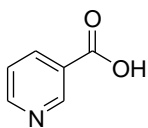
Ibuprofen



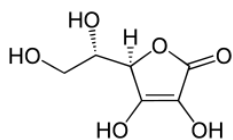
Gentisic Acid

2D.3 Determine if the following vitamins are fat-soluble or water-soluble.

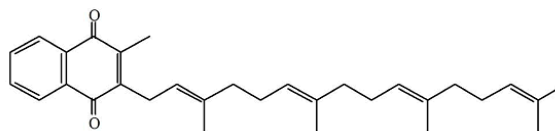
a) Vitamin B<sub>3</sub>



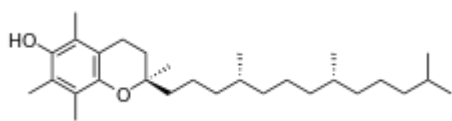
b) Vitamin C



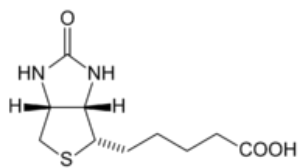
c) Vitamin K



d) Vitamin E



e) Vitamin B<sub>7</sub>



f) Vitamin B<sub>5</sub>

