CHEM1405 (Vet. Science) - June 2004

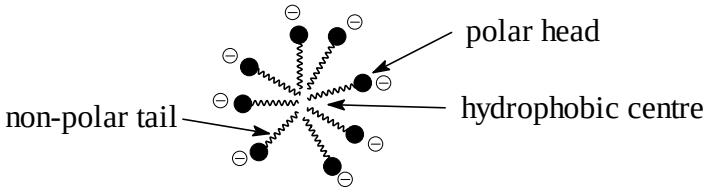
2004-J-2

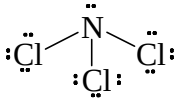
- $Ca_5(PO_4)_3OH(s) \rightarrow 5Ca^{2+}(aq) + 3PO_4^{3-}(aq) + OH^-(aq)$

- They provide binding sites for substrates that readily accommodate changes in geometry. Depending on the metal, they can also allow for redox reactions, eg Fe^{2+}/Fe^{3+}.

- 2.44×10^3 kJ

- Long chain fatty acids consist of a polar head and a non-polar tail. When dispersed in water they arrange themselves spherically so that the polar (hydrophilic) heads are interacting with the polar water molecules and the non-polar (hydrophobic) tails are interacting with each other. This arrangement is called a micelle.



- 

2004-J-3

- +0.62 V

  9.4×10^{20}

- 6.4 atm

2004-J-4

- 2.10×10^{-7} M^2

- 4.19

  Yes, because the concentrations of weak acid and conjugate base are equal - good buffers require this ratio to be between 0.1 and 10. Note that the concentrations are only 0.01 M, so that the buffer does not have a very great capacity. It will buffer effectively for small amounts of added H^+ or OH^-, but large amounts will quickly cause the weak acid/conjugate base ratio to move outside the 0.1-10 range.

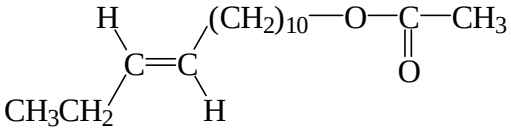
- Shift to the left (reactant)

  Shift to the right (product)

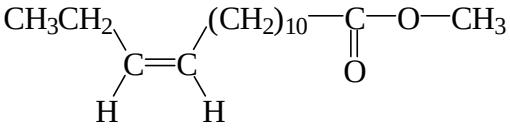
2004-J-5

- alkene, ester

achiral

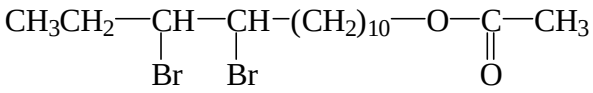


stereoisomer

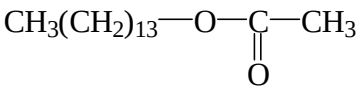


constitutional isomer

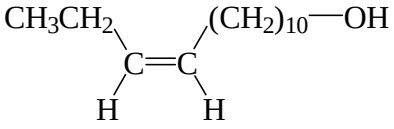
(Note: Many other examples possible)



racemic mixture

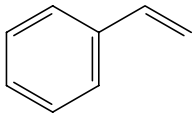


achiral



+ $CH_3CO_2^{\ominus}$

2004-J-6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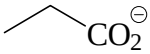
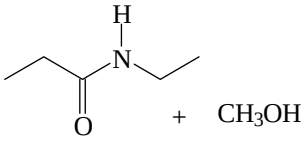
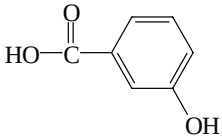
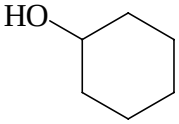
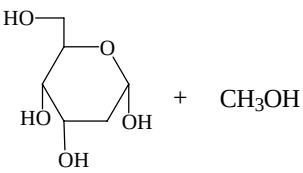
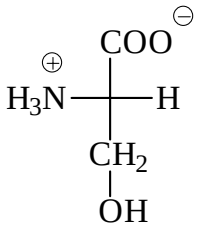
		
		
		
		
		

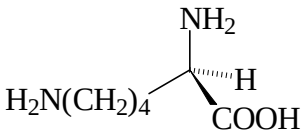
2004-J-7

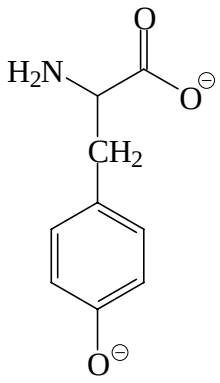
- (S)-5-hydroxy-2-hexanone

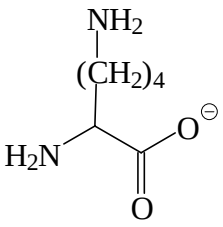
  1-bromo-3-methyl-2-butene

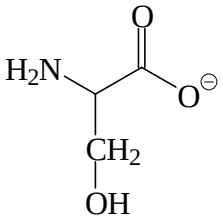
2004-J-8

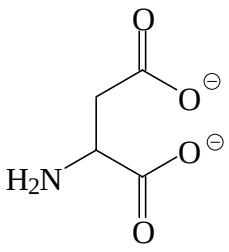












NH_3

At pH = 5.7, tyrosine exists as an overall net uncharged zwitterion. At pH > 5.7, tyrosine has a net negative charge and at pH < 5.7, tyrosine has a net positive charge.