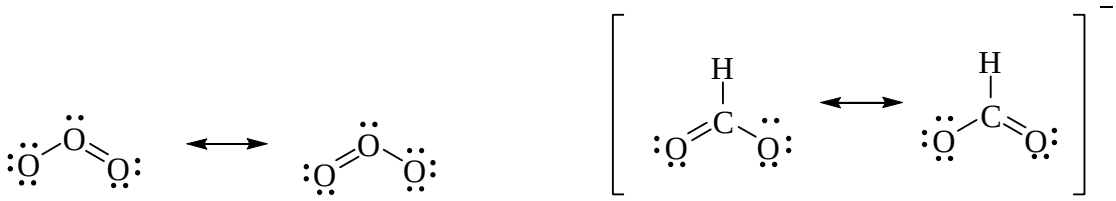
CHEM1405 (Vet. Science) - June 2005

2006-J-2

- 

- 0.094 atm
- Blood plasma is isotonic with cells (same osmotic pressure). Using saline drip of same osmotic pressure as blood prevents haemolysis or crenation of red blood cells.
- $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^6$

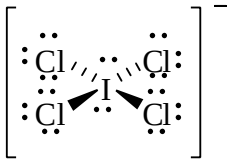
2006-J-3

- 1.47 g

  1.69 L

  CH_4 and I_2 have weak dispersion forces. The I atom is large many-electron atom so is more easily polarised than the C or H in CH_4 and therefore I_2 has greater dispersion forces and the higher m.p. NaCl is ionic compound with strong coulombic attraction between the Na^+ ions and the Cl^- ions. Silica is covalent network solid. Melting requires breaking of the very strong covalent Si–O bonds, so it has the highest m.p.

2006-J-4

-  square planar

- The double helical structure is held together by hydrogen bonding between the cytosine and guanine (C≡G) and the adenine and thymine (A=T) base pairs. No H-bonding would occur if the electronegative N atoms in these bases were replaced with P atoms.
- 0.0090 g L^{-1}

2006-J-5

- –2794 kJ mol^{-1}

  –2530 kJ mol^{-1}

  Yes, ΔS is greater for $H_2O(g)$ than for $H_2O(l)$, so combustion in air will have greater overall ΔS.

2006-J-6

- 2.92

  4.83

  The solution in (b) will act as a buffer.

  Added H_3O^+ will be consumed: $Bu^- + H_3O^+ \rightarrow HBu + H_2O$

  OH^- will be consumed: $HBu + OH^- \rightarrow Bu^- + H_2O$

2006-J-7

- to the right (products)
  $-2.00\ kJ\ mol^{-1}$

2006-J-8

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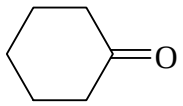
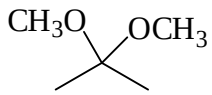
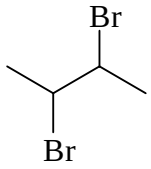
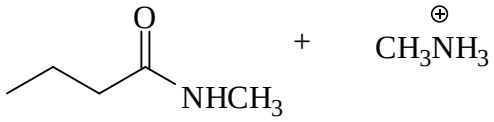
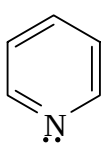


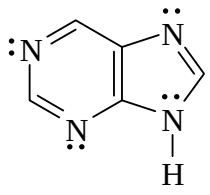


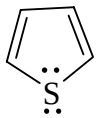




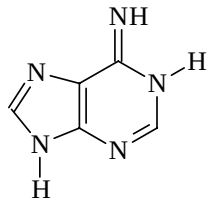
- The molecule must be cyclic.
  The ring system must have a conjugated π bond system.
  The number of electrons in the π bond system must be 4n+2 where n=integer.
  All atoms in the ring system must be sp^2 hybridised.
  The ring system must be planar.
  egs



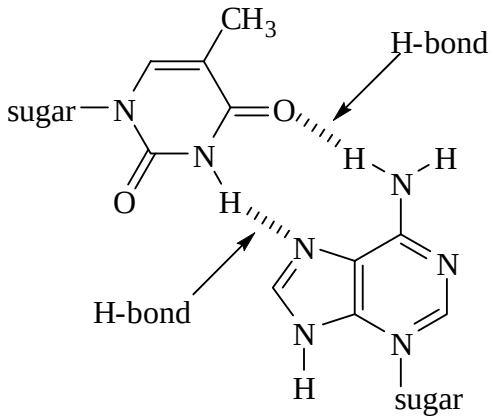




2006-J-9



Four different bases are found in DNA chains. The two strands in the double helix are held together by 3 hydrogen bonds between guanine (G) and cytosine (C), and by 2 hydrogen bonds between adenine (A) and thymine (T). The complementary bases C and G are called a "base pair". A and T are another "base pair".



2006-J-10

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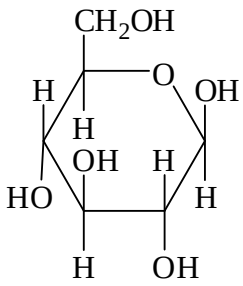
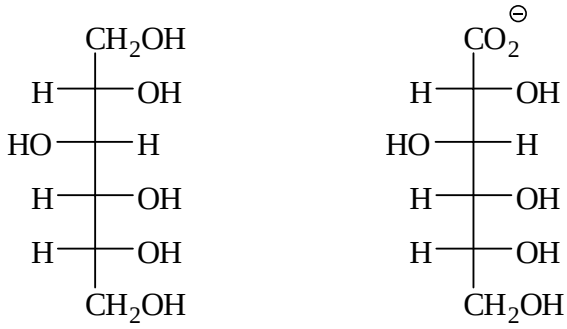
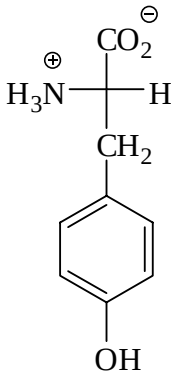




D-glucose will be water soluble as it has numerous alcohol functional groups which can hydrogen bond with the water molecules.

2006-J-11

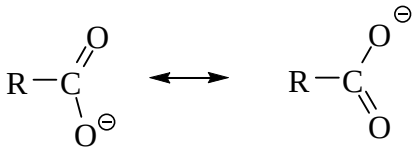
- 

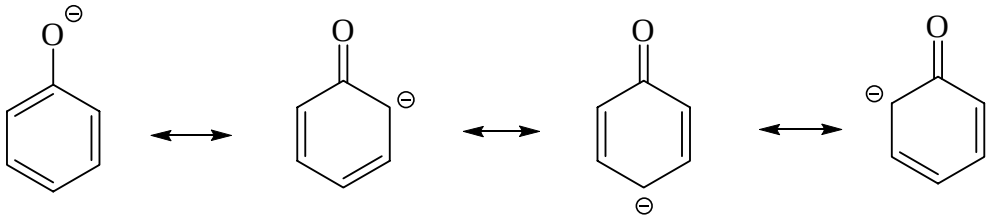
(*S*)

pI = 5.70

pI represents the isoelectric point - the pH at which there is no nett charge on the molecule.

Acid strength is dependent on the stability of the conjugate base. The carboxylate anion is resonance stabilised, with the charge being spread over the electronegative O atoms. The phenoxide anion is resonance stabilised also, but the charge in the resonance contributers is spead over the C atoms in the ring. C is not as electronegative as O, so these contributers are not as significant as that with the charge on the O. Resonance stabilisation is not as great as for carboxylate and therefore phenol is weaker acid than carboxylic acid.





2006-J-12

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