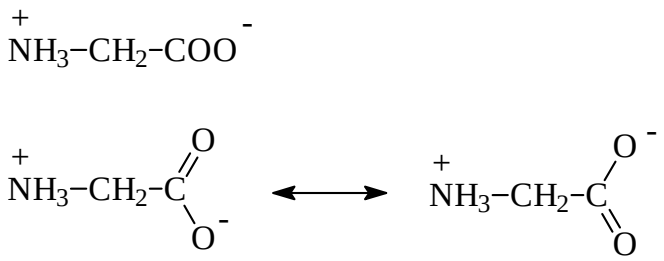
CHEM1405 (Vet. Science) - June 2005

2005-J-2

- 

N: sp^3 hybridised, tetrahedral geometry
C (CH_2) sp^3 hybridised, tetrahedral geometry
C (CO_2^-) sp^2 hybridised, trigonal planar geometry

The high melting point for this small molecule suggests strong intermolecular forces - in this case electrostatic attraction between zwitterions.

2005-J-3

- 2.80
- A buffer has a high (eg 0.10 M) concentration of HPO_4^{2-} and $H_2PO_4^-$ in equilibrium

  Upon addition of H_3O^+ the equilibrium moves to reduce acid added

  ie $HPO_4^{2-} + H_3O^+ \rightarrow H_2PO_4^-$

  Upon addition of OH^- the equilibrium moves to reduce base added

  ie $H_2PO_4^- + OH^- \rightarrow HPO_4^{2-}$
- Although PH_3 is a larger molecule with greater dispersion forces than ammonia, NH_3 has hydrogen bonding which is the dominant intermolecular force and results in a greater attraction between NH_3 molecules than there is between PH_3 molecules.

2005-J-4

- 0.154 M
  7.84 atm
  Saline solution is isotonic with blood plasma. Injection water would have a hypotonic effect and cause lysis of cells.

- $1s^2 2s^2 2p^6 3s^2 3p^6$
  eg n=1; l=0; m_l=0; m_s=+1/2

2005-J-5

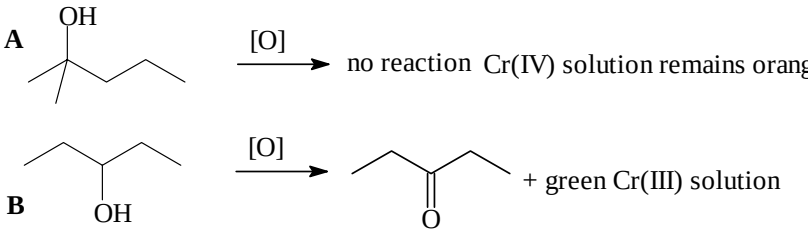
- $\Delta G° = -142.4$ kJ mol^{-1}; as $\Delta G° < 0$, the reaction is spontaneous.
  To the left
  9.17×10^{24} atm^{-1}
  T > 1056 K

2005-J-6

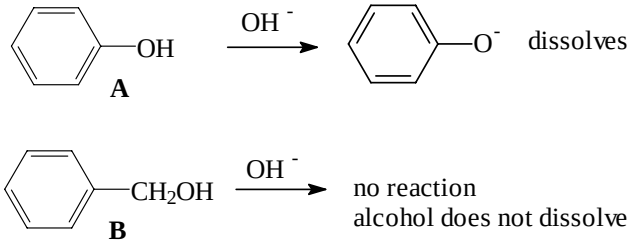
- 0.209 atm
- 15 min

2005-J-7

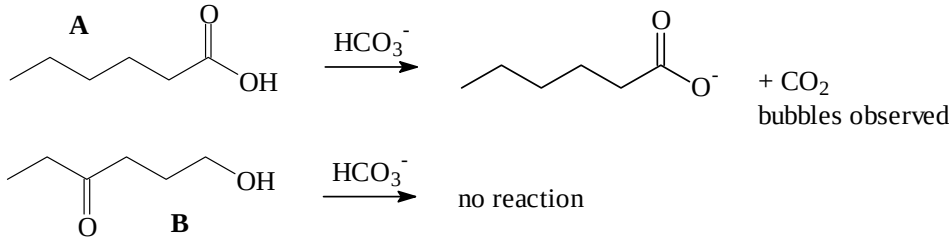
- Oxidation with acidified dichromate



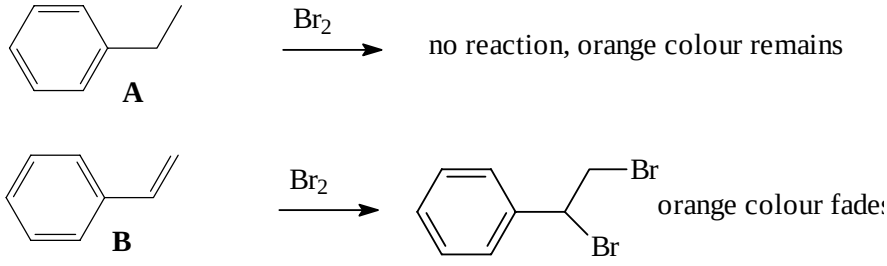
Reaction with aqueous hydroxide



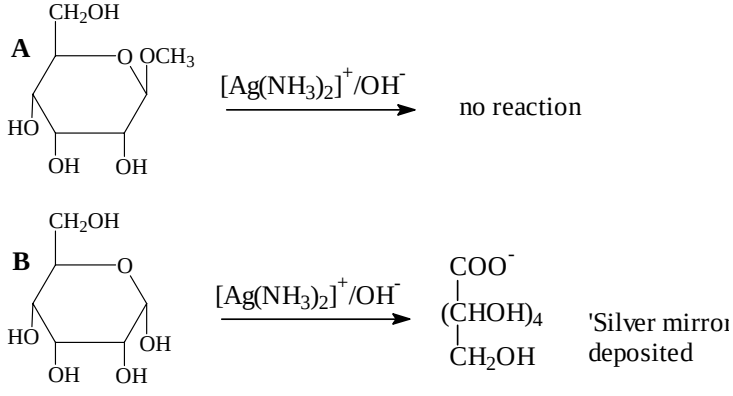
Reaction with hydrogencarbonate solution



Reaction with bromine solution



Silver mirror test - reaction with Tollens solution



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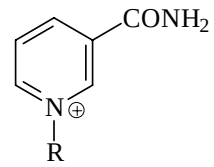
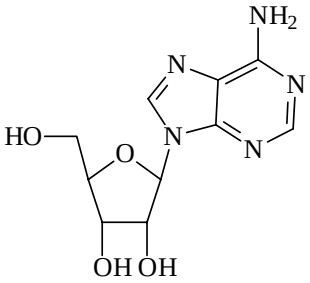
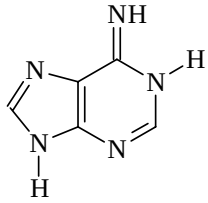
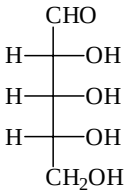
- 



2005-J-9





NADH (forward) NAD^+ (reverse)

2005-J-10

- (*R*),(*E*) - 5-bromo-2-pentene
  cis-2,6-dimethylcyclohexanone

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