FUNDAMENTALS OF CHEMISTRY 1B (CHEM1002) - November 2007

2007-N-2

- Allotropes are different structural forms of the same element
  eg C: diamond and graphite; oxygen O_2 and ozone O_3
- 9.2×10^{-9} g L^{-1}

  The solubility of $Fe(OH)_3$ will increase.

  The equilibrium $Fe(OH)_3(s) \rightleftharpoons Fe^{3+}(aq) + 3OH^-(aq)$ lies to the left.

  Addition of H^+ consumes the OH^-: $H^+(aq) + OH^-(aq) \rightarrow H_2O$

  and hence, from Le Chatelier's principle more $Fe(OH)_3(s)$ will dissolve.

2007-N-3

- Rate = $k[NO]^2[H_2]$

  Rate constant = 250 M^{-2} min^{-1}

2007-N-4

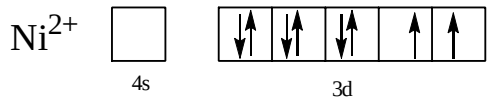
- 1.74

  8.43

  3.17

  LiF

2007-N-5

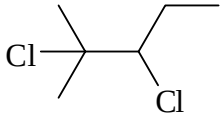
- S is much larger atom than O, so H–S bond is much longer and weaker than H–O, so H_2O is weaker acid than H_2S.
- 

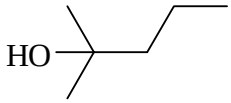
  Ni^{2+} is paramagnetic as there are 2 unpaired *d* electrons.

III	6	4	$K^+(aq)$, $[Mn(CN)_6]^{3-}(aq)$
II	6	6	$[Ru(NH_3)_5(H_2O)]^{2+}(aq)$, $NO_3^-(aq)$
III	6	3	$[Cr(en)_3]^{3+}(aq)$, $Cl^-(aq)$

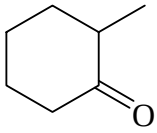
2007-N-6

2-methyl-2-pentene

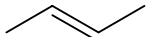


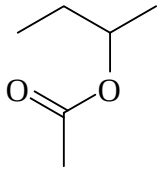


2-methylcyclohexanol



2-bromobutane





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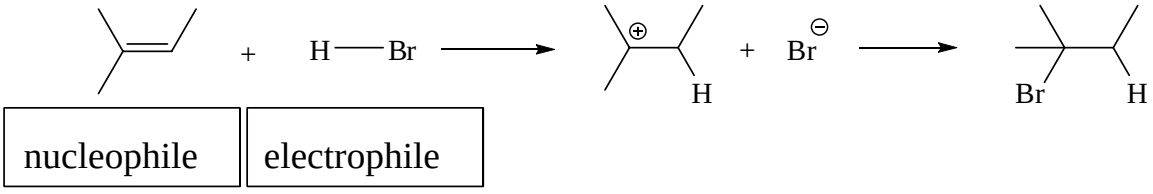
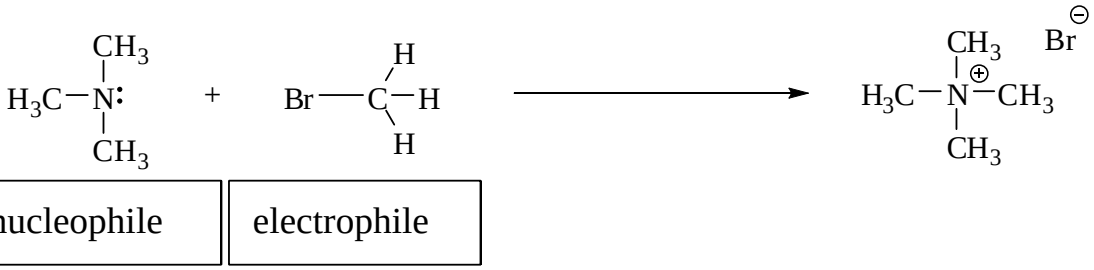
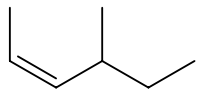
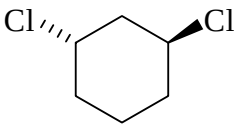
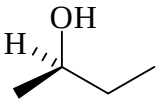
- 



- 





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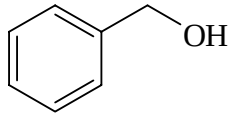
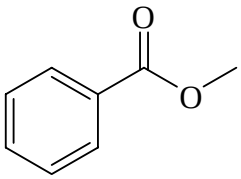
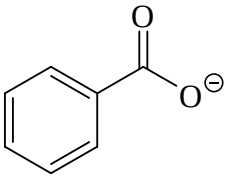
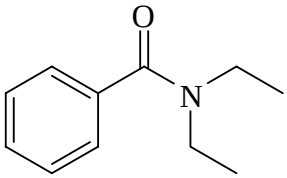


$SOCl_2$ / heat



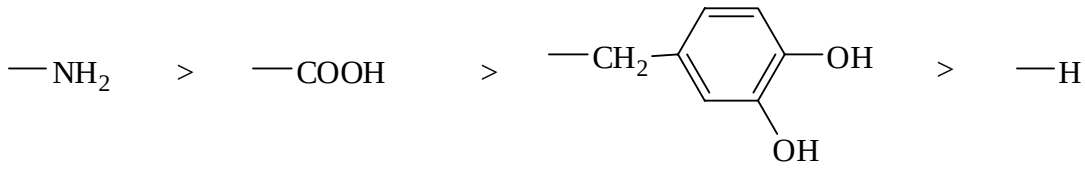
$Cr_2O_7^{2-}$ / H^+





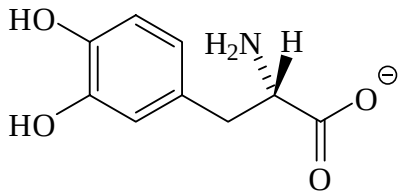
2007-N-9

• $C_9H_{11}O_4N$



(*S*)

a = arene (aromatic ring) **b** = carboxylic acid



2007-N-10

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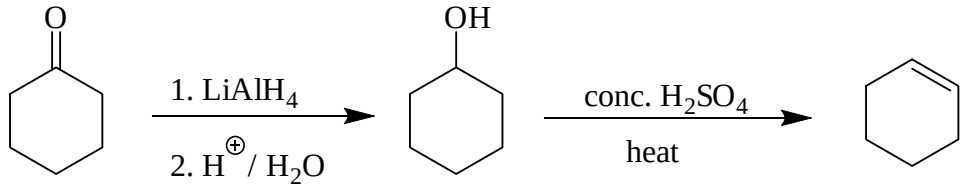

Starting material shows strong absorbance around 1700 cm^{-1} due to C=O group.

Intermediate shows strong absorbance around 3500 cm^{-1} due to O–H group.

Final product has no absorbance in these two regions.