CHEMISTRY 1B (CHEM1102) - November 2005

2005-N-2

- $1.74 \times 10^{-9}\ M^2$

- No

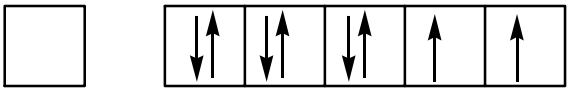
2005-N-3

- First order with respect to each reagent

  Rate = $6.0 \times 10^{-4}\ M\ s^{-1}$

2005-N-4

- Reducing agents provide a source of electrons. Group 1 metals are powerful reducing agents as their first ionisation energy is relatively low and loss of one electron results in a complete electron shell for the M^+ cation.

- Ni^{2+} 

  Ni^{2+} is paramagnetic as there are two unpaired electron spins.

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Formula	Oxidation state of transition metal	Coordination number of transition metal	Number of *d*-electrons in metal in complex ion	Species formed upon dissolving in water
$K_3[FeF_6]$	III	6	5	K^+, $[FeF_6]^{3-}$
$[Cr(NH_3)_5(H_2O)]Cl_3$	III	6	3	$[Cr(NH_3)_5(H_2O)]^{3+}$, Cl^-
$[Zn(en)Cl_2]$	II	4	10	$[Zn(en)Cl_2]$

2005-N-5

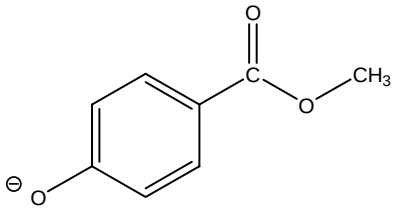
- Allotropes are different structural forms of the same element (eg C: diamond and graphite; P: red and white phosphorus)

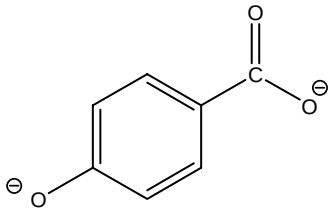
2005-N-6

- 2.01
  8.24
  3.29
  HF

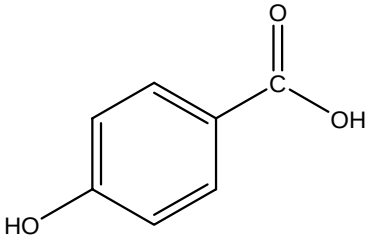
2005-N-7

- $C_8H_8O_3$
  a: phenol; b: ester



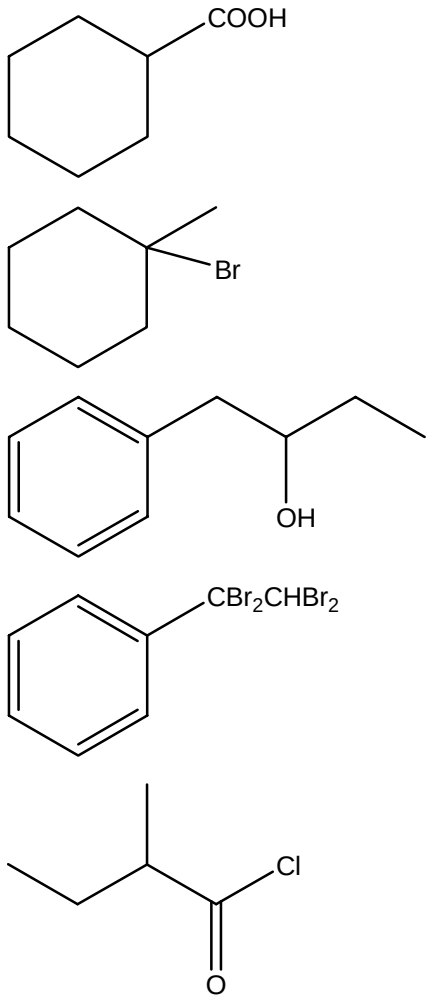


+ CH_3OH

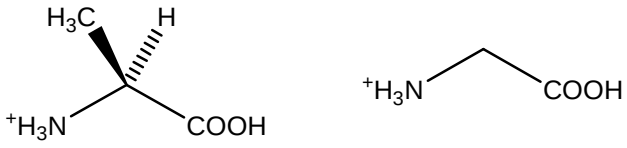


+ CH_3OH

2005-N-8

- 

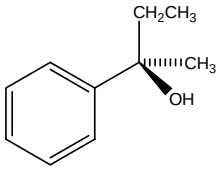
2005-N-9

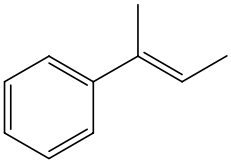
- 

2005-N-10

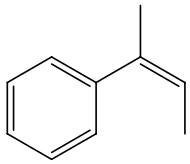
- Racemic mixture

$OH > C_6H_5 > CH_2CH_3 > CH_3$

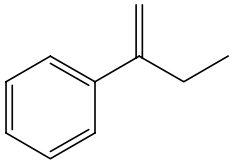




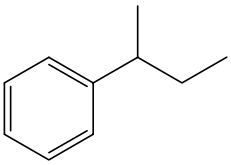
(*E*)-2-phenyl-2-butene



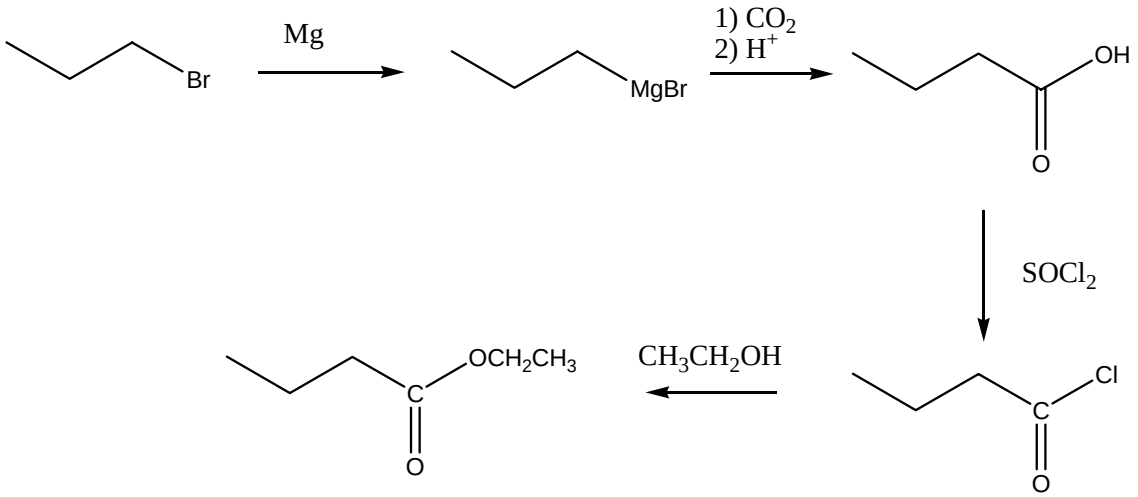
(Z)-2-phenyl-2-butene



2-phenyl-1-butene



2005-N-11

- 

HBr