

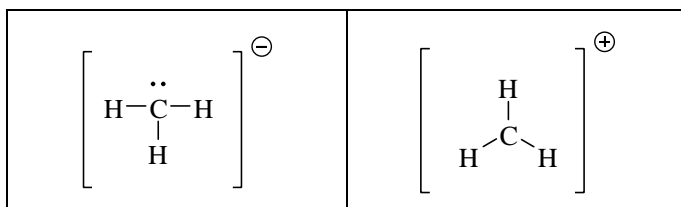
CHEM1611 Chemistry 1A (Pharmacy) - June 2007

2007-J-2

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	carbon dioxide	+IV	0
	sodium chromate	+VI	0
	iron(III) chloride-3-water	+III	5
K ₂ SO ₄			

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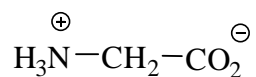


CH₃⁻ will be more stable as it has a full octet of electrons

- 1.45 g

2007-J-3

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C1 (terminal C)	<i>sp</i> ²	trigonal planar
C2 (middle C)	<i>sp</i> ³	tetrahedral
N	<i>sp</i> ³	tetrahedral

Major intermolecular force is ionic bonding between the positively and negatively charged ends of the molecule.

- 13.6 kg

2007-J-4

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0.386 g

0.0444 M

0.133 M

2007-J-5

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(*E*)-2-bromo-3-chloro-2-pentene

1,4-dimethylcyclohexene

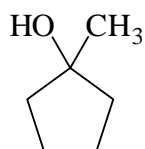
propyl acetate

(*Z*)-3-penten-2-one

2,4,6-tribromophenol

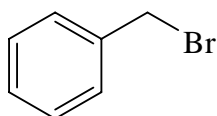
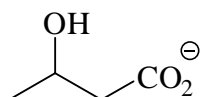
2007-J-6

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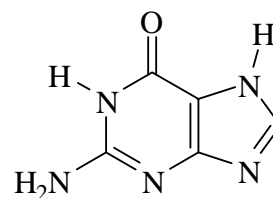
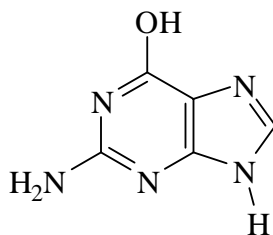
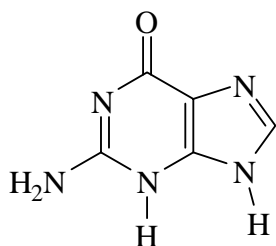
$\text{FeCl}_3/\text{Cl}_2$ or $\text{AlCl}_3/\text{Cl}_2$

$\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$



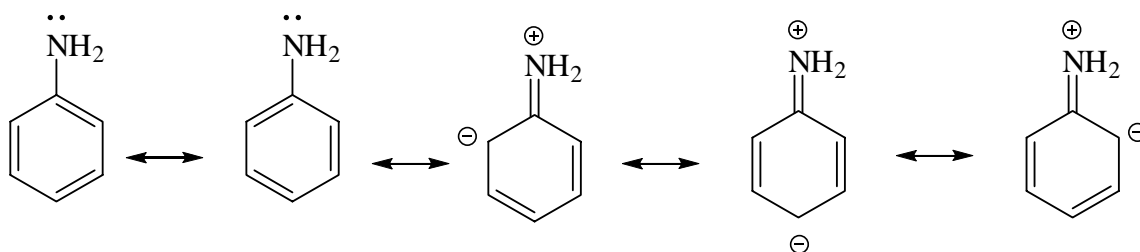
2007-J-7

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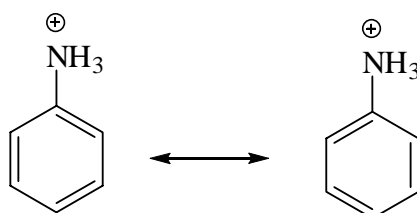


(other structures are also possible.)

- Triethylamine ($\text{p}K_b = 2.99$) is much stronger base than aniline ($\text{p}K_b = 9.37$), *i.e.* there is a much greater tendency for the former compound to react with H^+ ion. This is because aniline has a number of resonance contributors in which the lone pair on the nitrogen is delocalised into the aromatic ring. This delocalisation means that the lone pair on the nitrogen is less available to react with the H^+ ion.

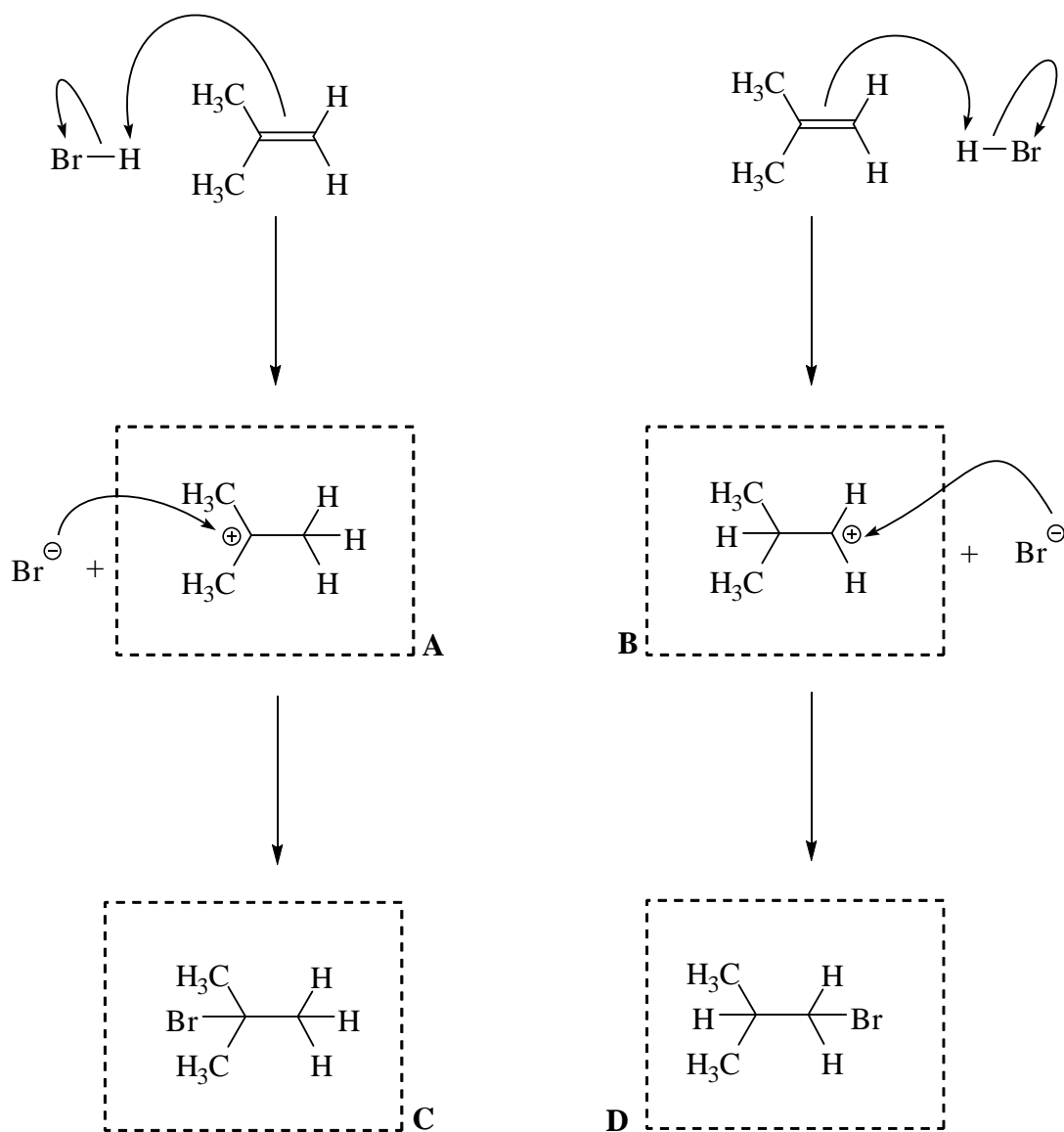


Alternative explanation: The anilinium ion has just two resonance contributors (aniline has the five shown above), so there is a loss of resonance stabilisation energy on reaction with H^+ ion.



2006-J-8

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C will be the major product as intermediate **A** (a tertiary carbocation) is much more stable than intermediate **B** (a primary carbocation).

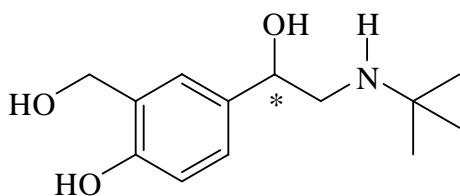
electrophilic addition

2007-J-9

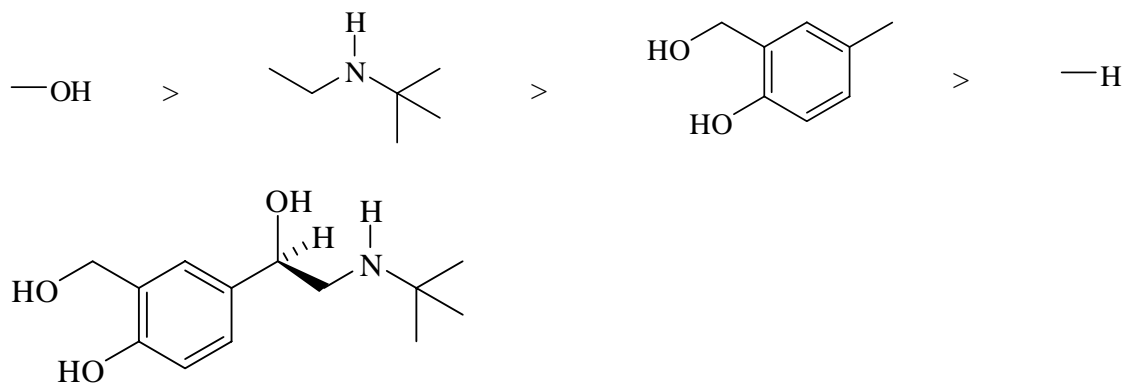
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$\text{C}_{13}\text{H}_{21}\text{O}_3\text{N}$

alcohol (primary and secondary), phenol, amine (secondary)

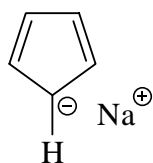


2007-J-9 (continued)

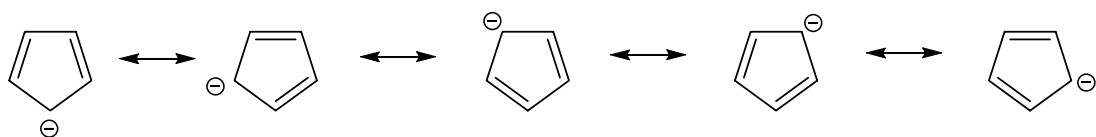


2007-J-10

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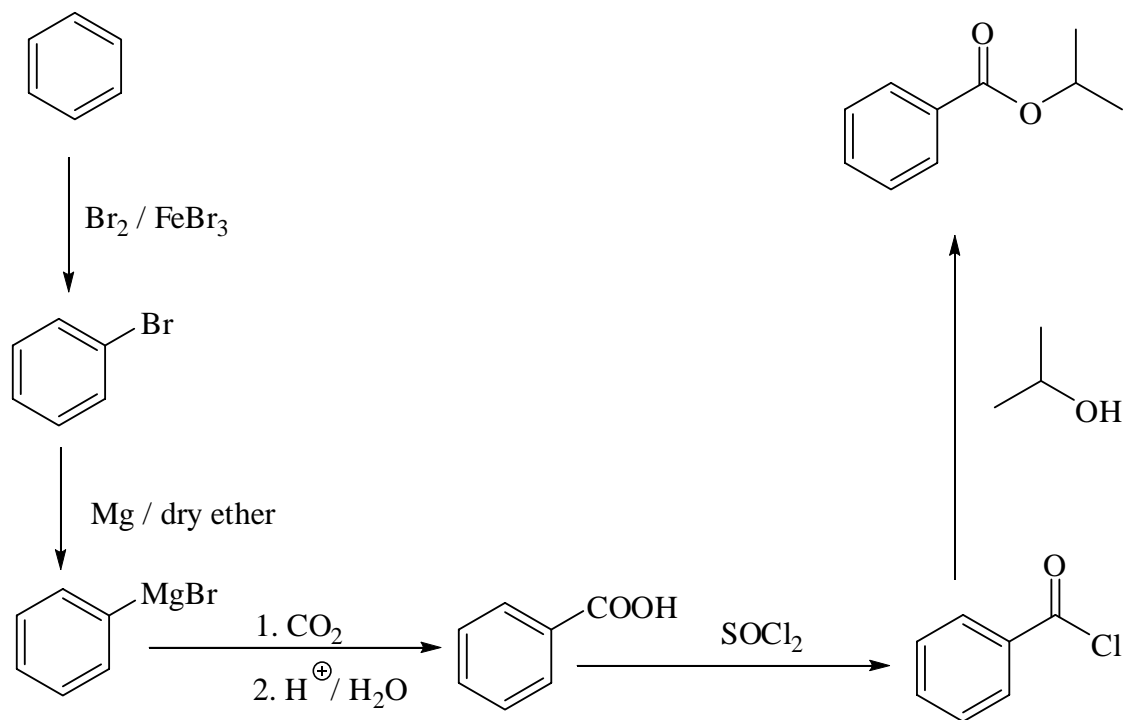


The product is relatively stable because it is aromatic (6 π electrons, flat ring with all ring atoms sp^2 hybridised). The negative charge is delocalised over the entire ring as shown in the five resonance contributors below.

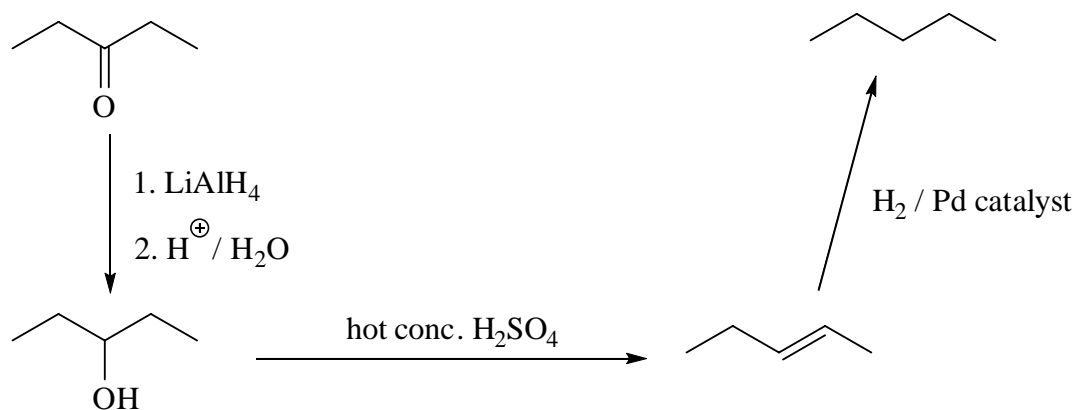


2007-J-11

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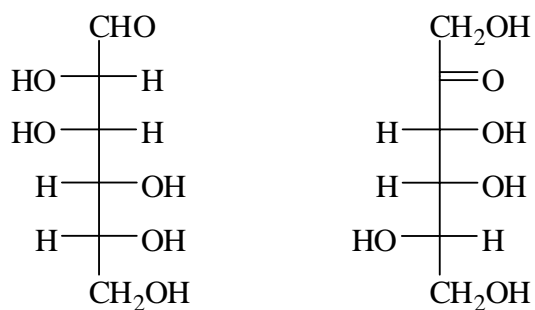
2007-J-11 (continued)



2007-J-12

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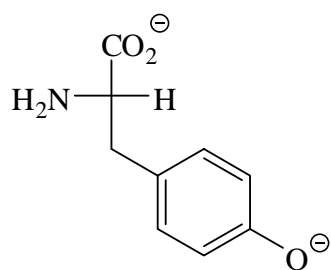
A: not reducing B: reducing



ketohexose
 D-mannose
 L-tagatose

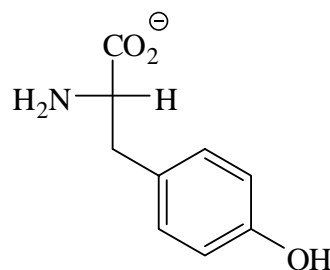
2007-J-13

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charge: -2

pI = 5.66



charge: -1

