

Chemistry 1Adv/ISSP (Chem1902/1904) November 2001

2001-N-2

- diamminetetrachloroplatinum(IV)-2-water  
 $[\text{PtCl}_4(\text{NH}_3)_2]$   
Cl N  
 $5d^6$
- $\text{Al}^{3+}(\text{aq}) + 4\text{OH}^{-}(\text{aq}) \rightarrow [\text{Al}(\text{OH})_4]^{-}(\text{aq})$   
 $\text{LiH}(\text{s}) + \text{H}_2\text{O} \rightarrow \text{Li}^{+}(\text{aq}) + \text{OH}^{-}(\text{aq}) + \text{H}_2(\text{g})$   
 $\text{NiS}(\text{s}) + 2\text{H}^{+}(\text{aq}) \rightarrow \text{Ni}^{2+}(\text{aq}) + \text{H}_2\text{S}(\text{g})$   
 $\text{F}_2(\text{g}) + 2\text{Br}^{-}(\text{aq}) \rightarrow \text{Br}_2(\text{aq}) + 2\text{F}^{-}(\text{aq})$   
 $\text{Co}^{2+}(\text{aq}) + 6\text{NH}_3(\text{aq}) + 6\text{H}_2\text{O} \rightarrow \text{Co}(\text{OH})_2(\text{s}) + 6\text{NH}_4^{+}(\text{aq})$

2001-N-3

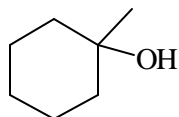
- 7.00 (The  $[\text{OH}^{-}]$  from  $\text{Fe}(\text{OH})_3$  dissolving is less than the  $10^{-7}$  M present in water.)  
yes  
 $3.2 \times 10^{-13} \%$

2001-N-4

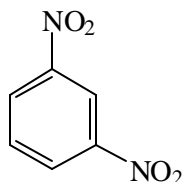
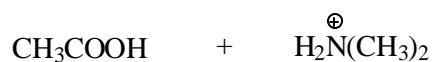
- II ie  $\text{Co}^{2+}$

2001-N-5

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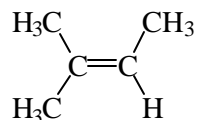
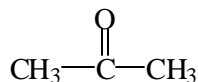
1-methylcyclohexanol



*m*-dinitrobenzene

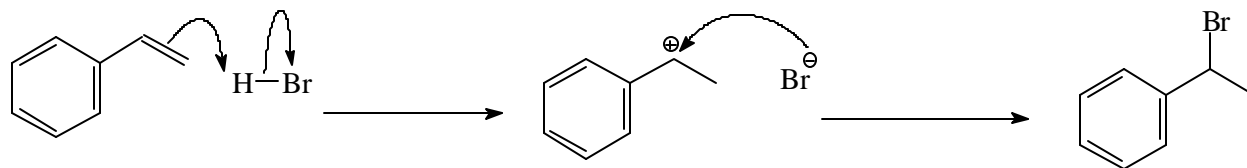
or

1,3-dinitrobenzene

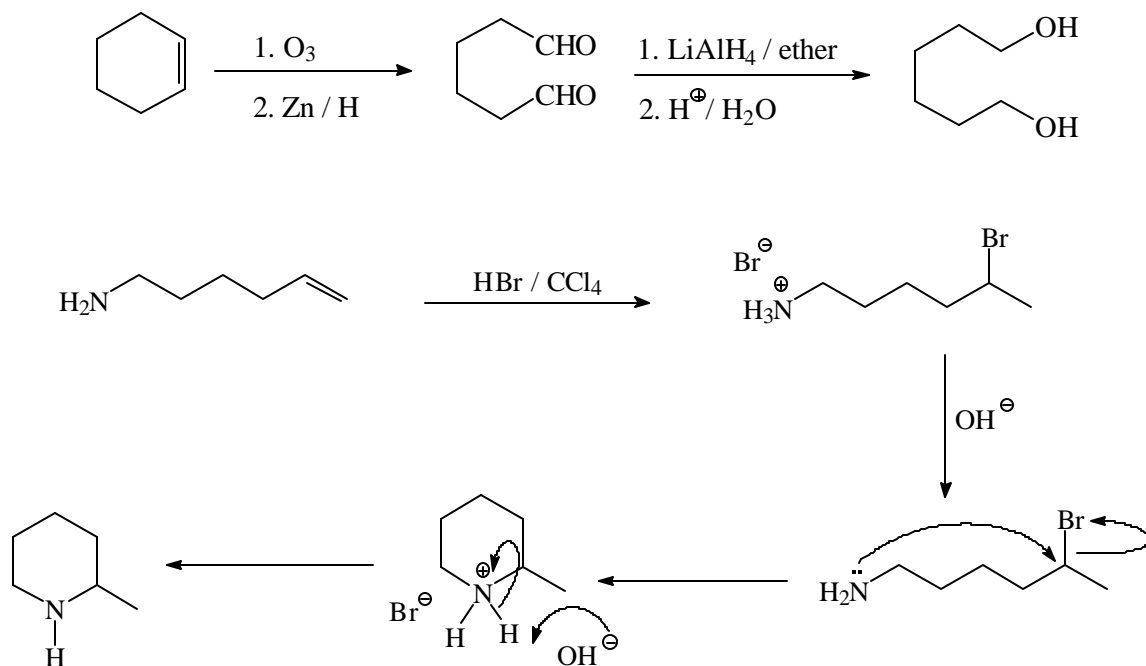


2-methyl-2-butene

2001-N-6

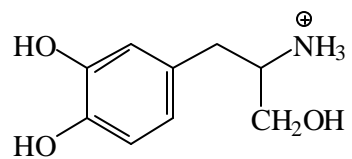
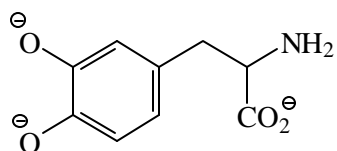
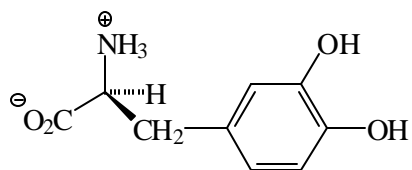
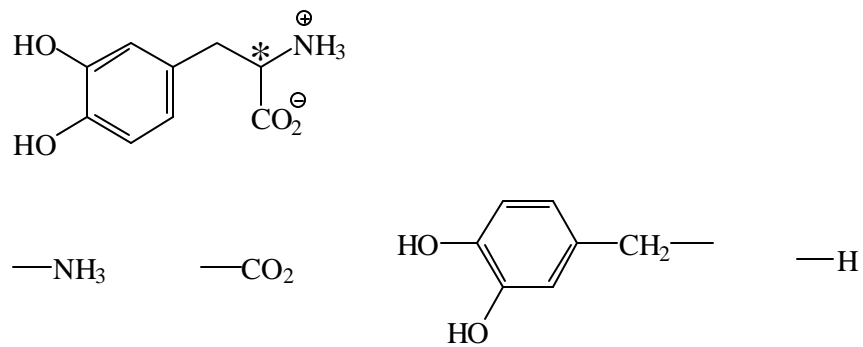


The intermediate formed is a very stable benzylic carbocation - the positive charge can be resonance stabilized by the aromatic ring. It is formed in preference to the primary carbocation, which would lead to the primary alkyl bromide.



2001-N-7

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2001-N-8

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- A: NaNH<sub>2</sub> / liquid NH<sub>3</sub>
- B: CH<sub>3</sub>CH<sub>2</sub>I
- C: H<sub>2</sub>(g) / poisoned Pd catalyst
- D: dilute H<sub>2</sub>SO<sub>4</sub>
- E: Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> / H<sup>+</sup>