Chemistry Mark Scheme

Daya Singh

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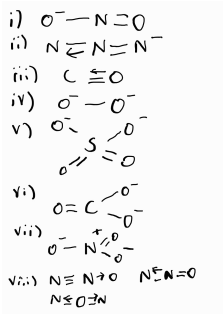
Introduction

This isn't really a mark scheme because that would require me to put in way too much effort for a project I did 3 weeks before my A-Levels. But, the lack of a mark scheme is irksome so this is a pseudo unprescriptive (and definitely not OCR-standard) mark scheme that has all the answers.

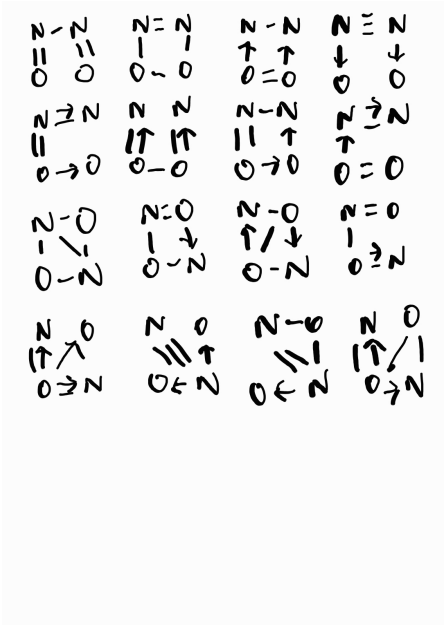
1 Answers

1. (a)



   (b) In total there are 10 missing electrons from the atoms involved (even with anions and cations net neutrality keeps this the same). A dative and/or normal bond fills 2 at a time, meaning 5 is required in total.

   (c)



2. (a) $O(CHO)_2 + O_2 \rightarrow 2CO_2 + H_2O$

   (b) $CH_2(OH)_2 + O_2 \rightarrow CO_2 + 2H_2O$

   (c) Consider the total bonds in both:

- $2(C=O)+2(C-H)+2(C-O)+(O=O) \rightarrow 4(C=O)+2(O-H)$
- $2(O-H)+2(C-H)+2(C-O)+(O=O) \rightarrow 2(C=O)+4(O-H)$

Cancelling bonds that remain on both sides:

- $2(C-H)+2(C-O)+(O=O) \rightarrow 2(C=O)+2(O-H)$
- $2(C-H)+2(C-O)+(O=O) \rightarrow 2(C=O)+2(O-H)$

It's the same reaction, hence the enthalpy change is the same, 517kJmol^{-1}

(d) It may not be accurate because bond enthalpy is the energy required to break one mole of gaseous bonds, which is not the same environment as in this reaction.

(a) i. **F** (Oxidation), **B** (Oxidation), **G** (Neutralisation)

ii. **E**

iii. 

iv. **G** (Neutralisation), **B** (Substitution)

v. **C**, **E**, **G**

vi. **D**

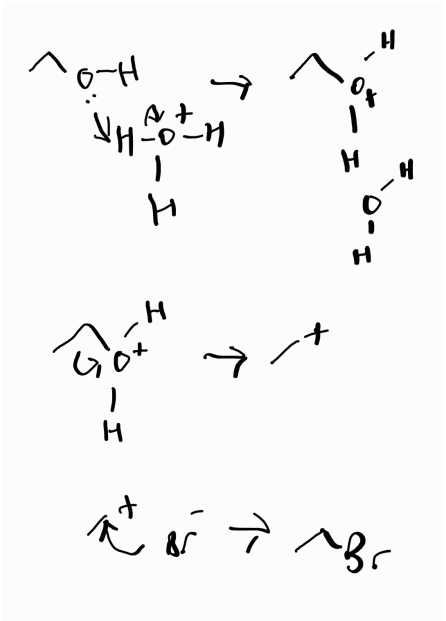
vii. **B**-**E**, **E**-**G**, **G**-**D**, **F**-**D**. (4)

viii. **E**

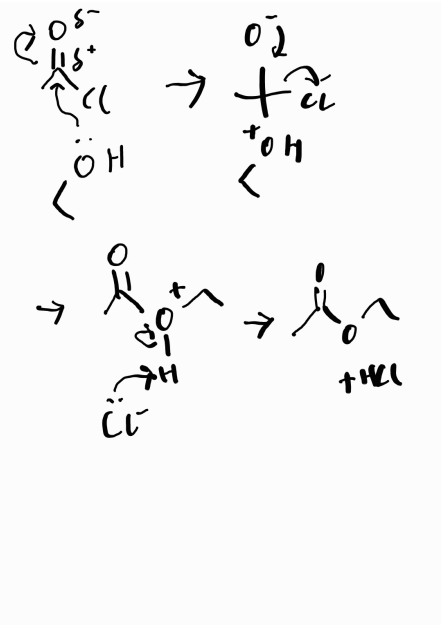
(b) A Starting from the left to the right. You have a doublet with $\int = 3$, a quintuplet with $\int = 1$, a doublet with $\int = 1$ and a singlet with $\int = 1$ which disappears upon adding D_2O

3. (a) The top is HBr. In the middle is a reflux reaction with acidified dichromate to get ethanoic acid. The bottom is a reaction with $SOCl_2$ to get ethanoyl chloride.

(b)



(c)



4. (a) 2-ethylbutene

(b)