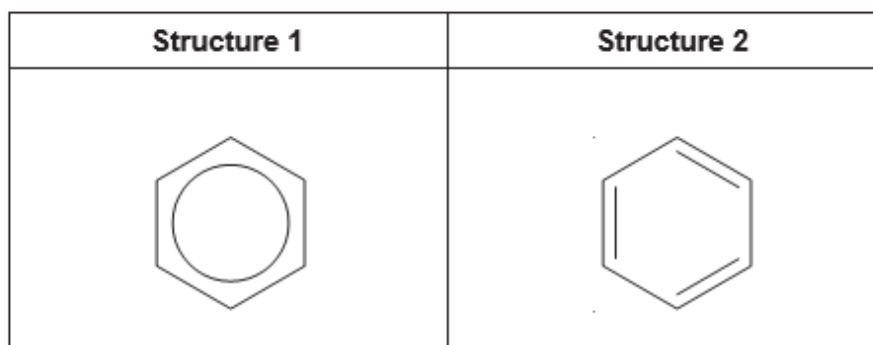


A Level Chemistry B (Salters)
H433/01 Fundamentals of chemistry

Question Set 25

- 1 (a) (i) Two possible representations for benzene (C₆H₆) are shown below.



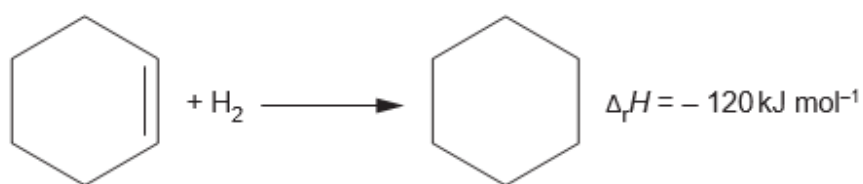
Compare and explain the bond angles and bond lengths predicted by each structure.

Bond angles

Bond lengths

[4]

- 1 (a) (ii) The equation below shows the hydrogenation of cyclohexene.

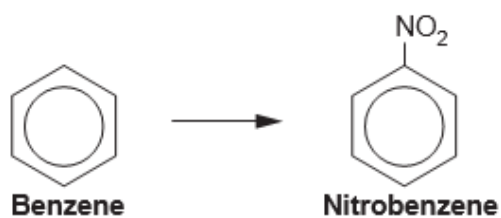


When benzene is reacted with hydrogen to form cyclohexane the enthalpy change is found to be -208 kJ mol^{-1} .

Explain why this data supports structure 1 rather than structure 2.

[2]

- 1 (b) (i) A student wants to synthesise a dye. The first step in the formation of the dye is shown below.



This is an electrophilic substitution reaction.

Give the conditions for the reaction and an equation to show how the electrophile is formed.

Conditions

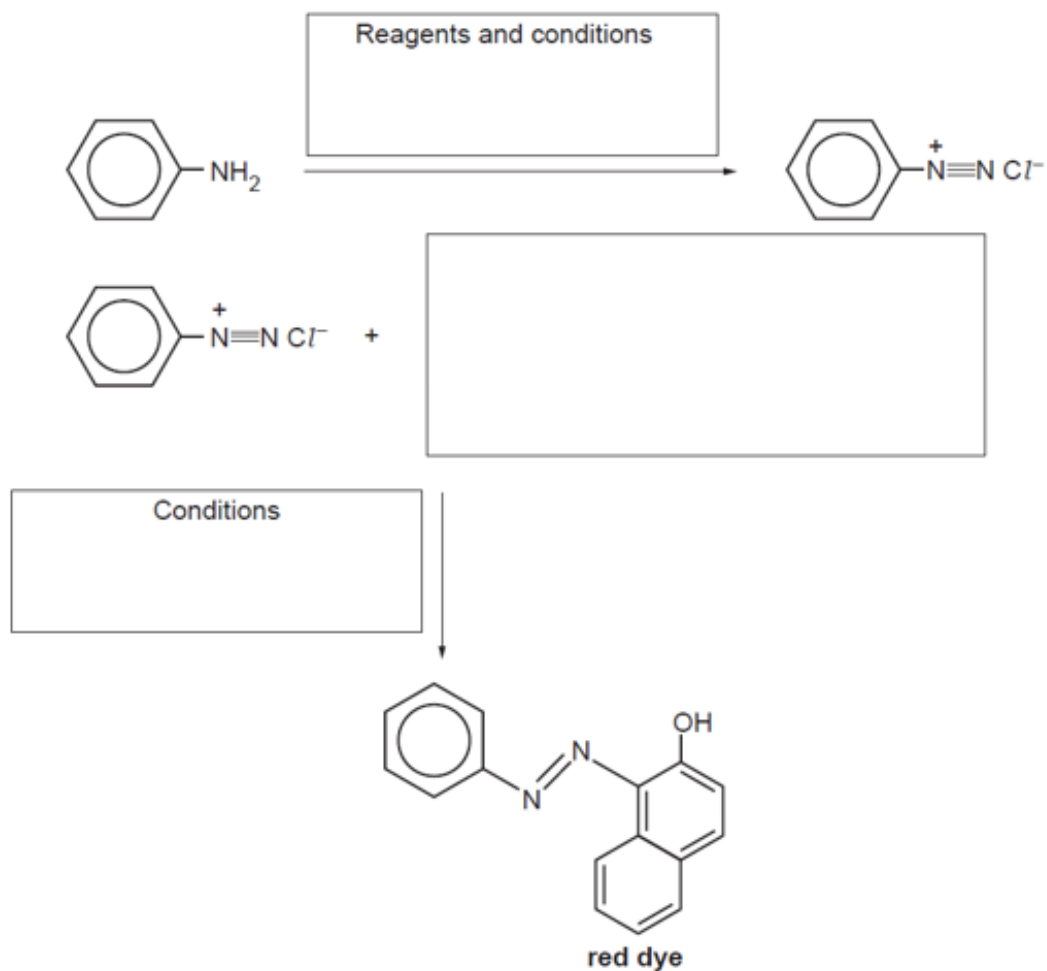
Equation for formation of the electrophile

[2]

1 (b) (ii) The nitrobenzene is then changed to phenylamine.

The flow diagram shows how the student could produce the red dye shown from phenylamine.

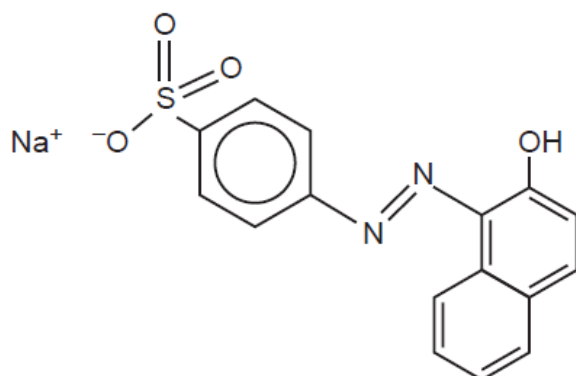
Complete the diagram by filling in the boxes.



[4]

1 (c) (i) The dye produced is not very soluble in water.

In order to increase its solubility it is converted to the structure below.



Name the -SO_3^- group..... [1]

Total Marks for Question Set 25: 13



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