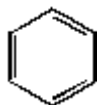
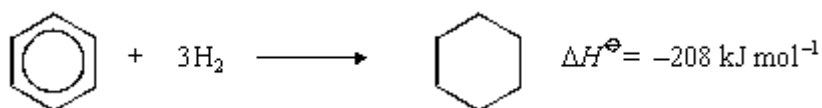
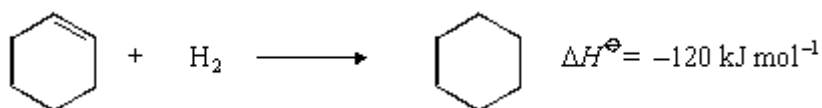


- Q1.** (a) Use the following data to show the stability of benzene relative to the hypothetical cyclohexa-1,3,5-triene.

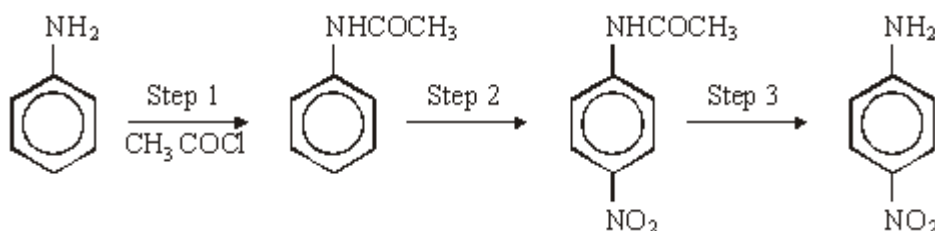


Give a reason for this difference in stability.



(4)

- (b) Consider the following reaction sequence which starts from phenylamine.



- State and explain the difference in base strength between phenylamine and ammonia.
- Name and outline a mechanism for the reaction in Step 1 and name the organic product of Step 1.
- The mechanism of Step 2 involves attack by an electrophile. Give the reagents used in this step and write an equation showing the formation of the electrophile. Outline a mechanism for the reaction of this electrophile with benzene.
- Name the type of linkage which is broken in Step 3 and suggest a suitable reagent for this reaction.

(17)  
(Total 21 marks)

**Q2.** Which one of the following does **not** contain any delocalised electrons?

- A** poly(propene)
- B** benzene
- C** graphite
- D** sodium

**(Total 1 mark)**