Section 17.2  HYDROGENATION OF 4-CYCLOHEXENE-cis-1,2-DICARBOXYLIC ACID

1. What is meant by the term catalytic hydrogenation?

2. What catalyst is used in this preparation, and how is it prepared?

3. Indicate how hydrogen gas is generated for the preparation of the catalyst; write a balanced equation to show this reaction.

4. What is the stereochemistry of catalytic hydrogenation? Cite an example that shows this.

5. Does the catalytic hydrogenation of 4-cyclohexene-cis-1,2-dicarboxylic acid show the stereochemistry of hydrogenation? Explain.
6. Aqueous acid is used as the solvent for the reaction. Could water at pH = 7 have been used as the solvent instead of the one that is used? Explain.

7. Does addition of concentrated HCl to an aqueous solution of the reduction product of this reaction increase or decrease the water solubility of the product? Why?

8. What hazardous mineral acid is produced by decomposition of chloroplatinic acid?

9. Underline the media appropriate for extinguishing fires involving sodium borohydride:
   Water   Carbon dioxide   Chemical powder   Foam

10. What abbreviated MSDS toxicological data, if any, are available for 4-cyclohexene-1,2-dicarboxylic acid?

11. What action should you take if sodium borohydride solution gets on your skin?