Catalytic hydrogenation accomplished by heterogeneous catalysts is undoubtedly a widely used method in research laboratories and industries, mainly due to its advantages over homogeneous catalysis: the stability of the catalyst, the ease of separation of product from it, a wide range of reaction conditions to selectively carry out a particular hydrogenation.

Chapter 5 is devoted to the hydrogenation of aldehydes and ketones. The reaction conditions for the conversion of aliphatic and unsaturated aldehydes to alcohols are examined. The hydrogenation of functionalised ketones is presented in the the rest of the chapter. Many examples concerning the stereoselectivity in the hydrogenation of cyclohexanones are included and a mention is given to enantioselective hydrogenations.

Chapter 6 examines the preparation of amines. The most extensively applied process is the reductive alkylation of amonia and amines with carbonyl compounds being the most extensive. The other approach, reported for the synthesis of secondary and tertiary amines, concerns the alkylation of primary and secondary amines with alcohols. Finally, the reductive asymmetric amination of α-oxo acids with chiral amines to produce enantiomerically enriched α-amino acids is illustrated, accompanied by an example of the asymmetric synthesis of cyclohexylylamines. An alternative access to amines, mainly used in industry, is covered in Chapter 7, the hydrogenation of nitriles. Selective conditions are illustrated to obtain different products (primary, secondary and tertiary amines, aldimines, aldhydes). Interestingly hydrogenation accompanied by side-reactions, which in some cases can be of synthetic utility are also highlighted.

Chapter 7 devotes the hydrogenation of functionalised ketones is presented in the chapter. Many examples concerning the the rest of the chapter. Many examples concerning the stereoselectivity in the hydrogenation of cyclohexanones are included and a mention is given to enantioselective hydrogenations.

Chapter 8 covers the hydrogenation of carboxylic acids, esters, and related compounds.

Chapter 9 is one of the longest and it covers the hydrogenation of aromatic compounds. The grade of hydrogenation and the stereochemistry of the substituted products are described. A section is devoted to the hydrogenation of phenols and phenyl ethers. The conclusive part deals with the hydrogenation of different classes of aromatic compounds (carboxylic acids and esters, aroylazines, naphthalenes, polynuclear benzenes). Chapter 10 details the hydrogenation of heterocyclic aromatic derivatives.

The last chapter is one of the most important from a synthetic point of view, dealing with hydrogenolysis. The hydrogenolysis of various types of bond is discussed in separate sections: C=O, C=N, C-X (X = halogen), C=C and hydrogenolysis of organic sulfur compounds. There are some typographical and structural errors in the book (Table 13.11, entry 2; equations 3.46, 5.1, 5.5, 5.6, 8.47, 9.86, 12.32).

As a general remark, the handbook can be considered as a stand point of reference and very useful experimental source of information for the preparation of the catalysts and the reaction conditions required for the heterogeneous hydrogenation of all functional groups. It is a welcome and valuable day-to-day manual for both academia and industry researchers.

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