

# INTRODUCTION

The story of steroids is one of the great epics of chemistry. The steroids are a family of substances critically important to plant and animal life. They include the adrenal cortical hormones, the sex hormone, some of the vitamins, plant sterols such as ergosterol and animal sterol such as cholesterol. Cholesterol is the chief sterol of mammalian tissue and obligate precursor of steroidal hormones. It is the first steroidal compound to be known and was reported by Chevreul.

The discovery of steroids can be accredited to Michael-Eugene, Chevreul who in 1812 A.D. differentiated between the saponifiable and non-saponifiable animal lipids. In 1818 A.D. an incidental isolation of impure Cholic acid (one of 20 bile acids now recognised) from the non-saponifiable fraction of the ox bile was the next major step forward. A number of steroidal compounds were discovered in the subsequent year, but their steroidal nature was not established until 1934 A.D.

The most dramatic expansion of steroidal chemistry came in the year 1929-38 with the discovery of sex hormones and the adrenal cortical hormones. In recent years it has become increasingly evidential by modification of naturally occurring steroids, it is possible either to increase or decrease certain physiological properties. The interesting physiological properties of steroidal compounds and the discovery of a variety of oxygen and nitrogen containing

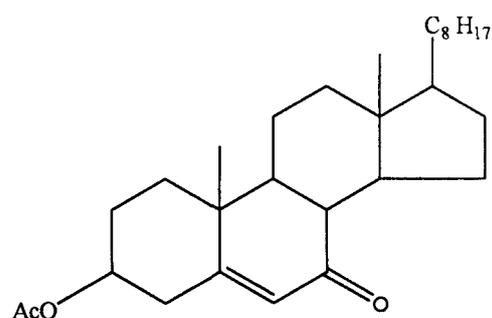
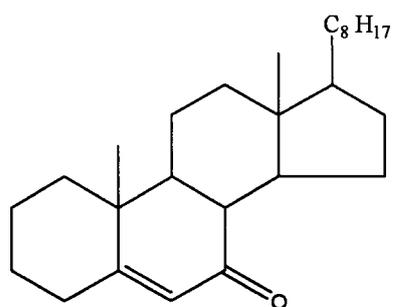
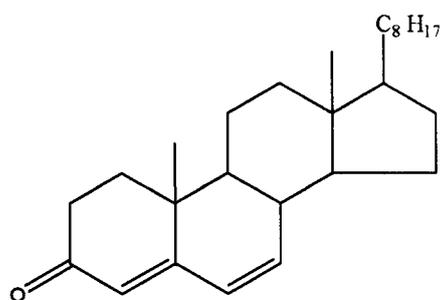
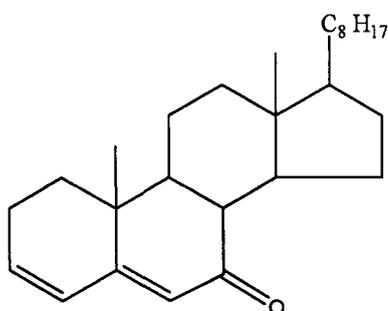
heterocyclic compounds with useful therapeutic properties, stimulated extensive research in steroids containing hetero-atom and this resulted in the preparation of variety of heterocyclic steroids with useful biological activities. The physiological activity of steroidal hormones depends on a number of factors. Among those of primary importance are stereochemistry and overall shape of the molecule. Even a fundamental change (introduction of hydroxyl group, double bond, acetate, chloro etc group ring enlargement and contraction etc.) in the steroidal nucleus should alter the stereochemistry to some extent. Every year a large number of these and related compounds are synthesized and screened for their chemical, biological, therapeutic and industrial potentials. By now a large number of steroids have been reported to show antimineralo, antigestagins, antimicrobial, anticancer, antiallergic activities <sup>1</sup>.

Alauddin and Martin-Smith <sup>2, 3</sup> and Martin-Smith and Surgue <sup>4</sup> have reviewed biological activities in steroids possessing nitrogen atom both of natural and synthetic origin.

Another important aspect for the steroidal compounds has been the fixed stereochemistry (now known for most of the cases) which has helped in the studies such as:

- a) Reaction mechanism and stereo chemical effects on the rate of reaction.
- b) Spectral studies to establish the stereochemistry and spectral relationship.
- c) Mass spectral fragmentation.

The chemistry of steroids has become a matter of immense interest in recent past because of their extra ordinary utility in research and industry. Previous work from our laboratories was concerned with the preparation of hitherto unknown aza and oxa steroids from some steroidal  $\alpha,\beta$ -unsaturated ketones and conjugated dienones as given below.



In the present work an attempt has been made to synthesize some unknown isoxazole derivatives mainly from  $\alpha,\beta$ -unsaturated steroidal ketones, and its characterization by spectral and chemical methods.