UNIVERSITI TEKNOLOGI MARA

IMPURITY PROFILING OF A DRUG SUBSTANCES

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ABSTRACT

Carbimazole is an antithyroid drug and is used in treating hyperthyroidism. Carbimazole itself is inactive, but it is rapidly converted to methimazole. This thesis described a thin layer chromatography (TLC) method and a validated high performance liquid chromatography (HPLC) detection method to identify and also to determine the amount of impurity present in carbimazole sample. Solvents used in TLC method were dichloromethane, chloroform and acetone as mobile phase. The TLC plate used was TLC aluminium sheets, 20 x 20 cm, Silica Gel 60 F254. The HPLC was equipped with column ZORBAX 300SB-C18, 5 µm, dimension 4.6 x 150 mm, manual injector with 20µl loop and a UV detector. The separation was achieved using acetonitrile and water as mobile phase at a flow rate of 1.2 ml/min.The impurity and amount of carbimazole in carbimazole tablet were found. The limit of detection on TLC method was 1 mg/ml while for HPLC was 0.025 µg/ml. A suitable method was developed to identify and quantitate carbimazole compound and its impurity in carbimazole tablet.

CHAPTER 1

INTRODUCTION

Decrease or reduction of thyroid activity and hormone effects can be done by agents that interfere with the production of thyroid hormones; by agents that modify the tissue response to thyroid hormones; or by destruction of the gland with radiation or surgery. Thyroid antagonists that are goitrogens are agents that reduce hormone T_3 (triiodothyronine) and T_4 (thyroxine) such that the feedback loop will increase TSH (thyroid stimulating hormone) release, stimulating the thyroid gland resulting in glandular hypertrophy or goiter.

Carbimazole (Figure 1.1) and Methimazole (Figure 1.3) are drugs that are used in treating hyperthyroidism.

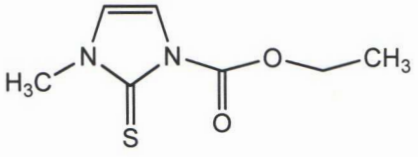

Figure 1.1. Structure of carbimazole.

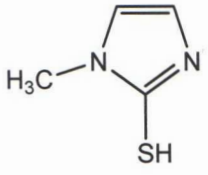

Figure 1.2. Structure of thiamazole