Bulletin of Pharmaceutical Research 2011;1(2):1-6
An Official Publication of Association of Pharmacy Professionals
ISSN: 2249-6041 (Print); ISSN: 2249-9245 (Online)

RESEARCH ARTICLE

ENHANCEMENT OF ABSORPTIVITY OF URSODEOXY CHOLIC ACID

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Received: May 14, 2011 / Revised: June 11, 2011 / Accepted: June 15, 2011

Official monograph of United States Pharmacopoeia describes the procedure to detect ursodeoxycholic acid using refractive index detector because of poor ability of ursodeoxycholic acid to absorb radiation in UV region of electromagnetic spectrum. Present work reports the derivatization procedure to enhance the UV absorption of ursodeoxycholic acid. Reaction with many chromophoric reagents has been performed including reaction with phenyl hydrazine, hydrazine and benzyl alcohol. Among reactions carried out, the successful one involved esterification of ursodeoxycholic acid using ethanol. Esterified derivative was subsequently reacted with hydrazine resulting in hydrazide derivative of ursodeoxycholic acid. Resultant hydrazide moiety was modified by allowing reaction with benzaldehyde; thus forming benzamide derivative which showed enhanced UV absorption evidenced by appearance of a unique peak in UV spectra of compound diluted in ethanol.

Key words: Ursodeoxycholic acid, UV Spectrophotometry, Derivatization, Esterification, Hydrazide.

INTRODUCTION

Ursodeoxycholic acid is a naturally occurring bile acid found in small quantities in normal human bile and in the biles of certain other mammals especially in polar bears. It is a bitter-tasting, white powder which is freely soluble in ethanol, methanol and glacial acetic acid, sparingly soluble in chloroform, slightly soluble in ether and insoluble in water. The chemical name of ursodeoxycholic acid is 3*α*, 7*β*-Dihydroxy-5*β*-cholan-24-oic acid (**Figure 1**). Ursodeoxycholic acid ($C_{24}H_{40}O_4$) USP has a molecular weight of 392.57 (Budavari, 2006). Electronic absorption spectra originate with the excitation of the electrons which form the bonds holding the molecule together. A chemical bond originates from the overlap of occupied atomic orbitals. σ bonding are usually bound strongly and considerable energy is required to promote these electrons to vacant molecular orbitals, hence absorption spectra involving σ-electrons are well observed in the vacuum ultraviolet region (< 200 nm).

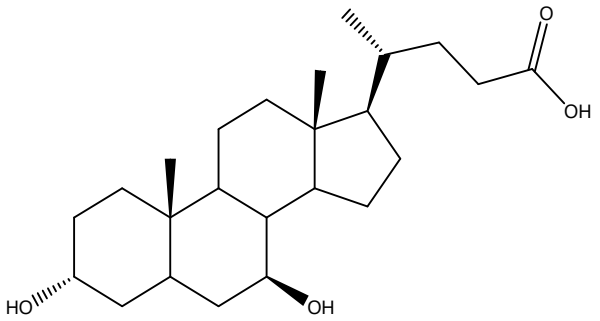

Fig. 1. Structure of ursodeoxycholic acid