CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Determination of Thiamazole In Serum

Purpose
Determination of thiamazole (1-methyl-2-mercaptoimidazole), an inhibitor of thyroid hormone synthesis, in serum.

Thiamazole (Figure 1) is widely used for the treatment of hyperthyroidism.

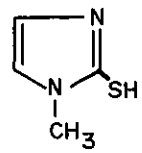

Figure 1. Structure of thiamazole

Existing Methods
Radiometric and colorimetric methods for sulfur. These methods may overestimate the concentration of the drug because of other sulfur-containing metabolites. Other methods include LCUV, TLC, GLC, and GC-MS. However, the precision and detection limits were inadequate for monitoring therapeutic plasma concentrations of this drug.

Reference
Determination of Thiamazole in Serum by High-Performance Liquid Chromatography with Electrochemical Detection, T. Tatsuhara, F. Tabuchi and M. Unate, J. Chromatogr. 339(1985) 149-156.

Conditions
Detection: Electrochemical, using a glassy carbon working electrode.
Potential: +0.70 V vs Ag/AgCl
Column: 10 µm, C-18 reverse phase (100 x 8 mm)
Mobile Phase: 0.01 M ammonium phosphate (pH 4.0), 1 mM Na_2EDTA, 8% methanol.
Detection Limit: In serum, 10 ng/mL
Linear Range: 5 ng/mL to 2 µg/mL

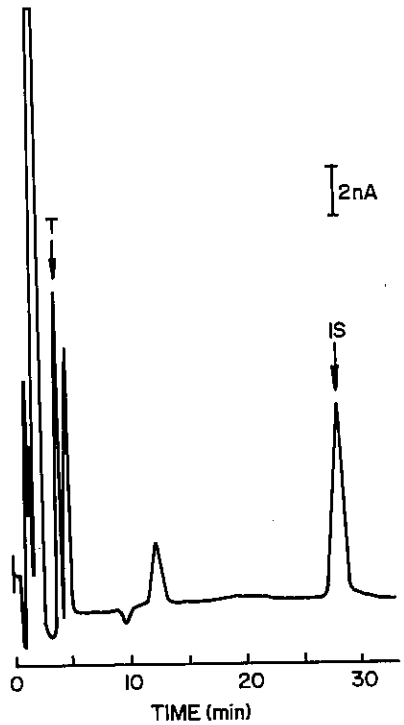

Figure 2. Chromatogram of a deproteinized serum sample from a volunteer, after administration of thiamazole. Redrawn from above-cited reference.

Sample Preparation
Deproteinization of 0.1 mL of serum with 0.3 mL methanol containing 48 ng of p-hydroxyanisole as internal standard. A 10-20 µL aliquot of the 10,000 x g supernatant was injected.

Clinical Application
This method should be appropriate for monitoring plasma thiamazole after administration of usual maintenance doses. Serum concentration-time profiles following a single oral administration of thiamazole are presented in the reference.

Notes

1. The results presented in this report can be duplicated using a BAS 400 or BAS 200 Problem Solver.

2. An advantage may be gained by detecting thiamazole via the sulfhydryl moiety. This can be accomplished by oxidation of the thiol functional group on a Hg/Au electrode. LCEC using a mercury-based electrode has been shown to be extremely sensitive and selective for thiols. The disulfide metabolites of thiamazole should also be detectable utilizing a modification of this technique. A BAS 200 Problem Solver with built-in deoxygenation capability is ideally suited to performing these studies. Refer to "Current Separations", Vol. 4, No. 3, LCEC Capsule 171, or Anal. Chem. 55(1983) 8-12, for more information.

The information in this publication is supplied as a service to our customers. Performance of the methodology has not necessarily been verified by the BAS technical staff.