

# CAPSULES

preliminary notes and applications from Bioanalytical Systems, Inc.

## Thiodiglycol In Aqueous Samples

### Purpose

Determination of 2,2'-Thiodiethanol in environmental samples.

2,2'-Thiodiethanol, commonly referred to as thiodiglycol (TDG), is the major hydrolysate of bis-(2-chloroethyl) sulfide (mustard gas). Because mustard gas is susceptible to hydrolysis, TDG is more likely to be encountered in the natural (aqueous) environment than mustard gas itself.

### Existing Methods

GC and LCUV. Both require time-consuming sample handling: for GC, isolation of TDG from the aqueous environment, and for LCUV, sample derivatization.

### Reference

Analysis of 2,2'-Thiodiethanol in Aqueous Matrices by Liquid Chromatography with electrochemical Detection, P.C. Bossle, S.F. Hallowell, D.J. Reutter, and E.W. Sarver, J. Chromatogr. 330(1985):388-391.

### Conditions

Detector: BAS LC-4B/17

Electrode: Platinum

Potential: +0.97 V vs. Ag/AgCl

Column: 10  $\mu$ m, C 18 reverse-phase (250 x 4.6 mm)

Mobile Phase: 95% 0.2 M sodium phosphate (pH 8.0), 5% acetonitrile, flow-rate 1.5 mL/min.

Detection Limit: 50 pg in a 5  $\mu$ L injection (S/N of 6)

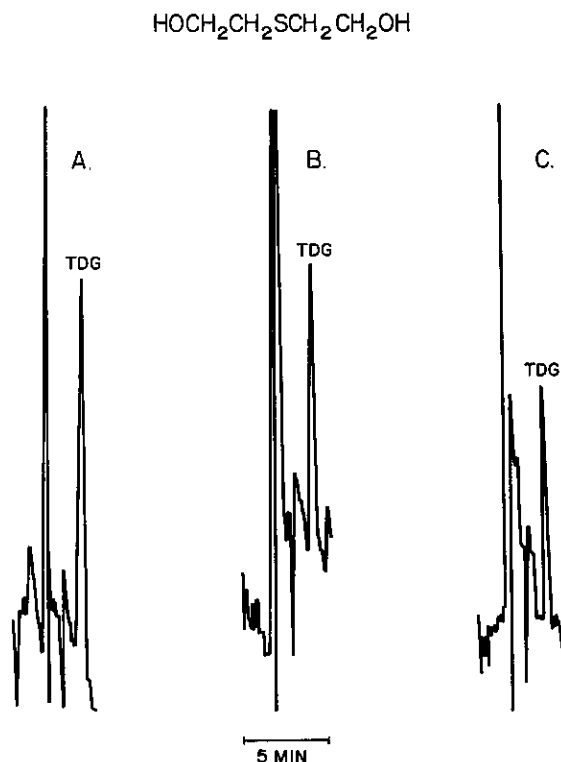
Linear Range: 50 pg to 2 ng injected (in 5  $\mu$ L)

### Sample Preparation

Soil samples were sonicated in deionized water and clarified by centrifugation and filtration. Soil extracts and filtered aqueous samples were injected into the liquid chromatograph.

### Notes

Alkyl sulfides are electrochemically active and can be oxidized at +0.8 to 1.0 V on a platinum working electrode. Reverse-phase chromatography can separate TDG from interfering compounds present in simple extracts of soil and ground water. Thus, LCEC can be used for the determination of trace levels of TDG in real world samples.



**Figure 1.** Chromatograms of TDG standard (A), spiked soil extract (B), and spiked ground water sample (C). TDG in all cases was at 1 ppm.

The determination of TDG presented in this report can be duplicated utilizing BAS 400 Electrochemical Analyzer or BAS 200 Problem Solver.

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

