Direct Analysis of Anti-Epileptic Drugs from Serum Using Microcolumn Switching/Capillary HPLC

INTRODUCTION

Clinical, pharmaceutical and bioanalytical samples are often minute and require very selective and sensitive techniques to analyze the compounds of interest. Reasons are that only limited sample quantities can be obtained, e.g., in clinical and bioavailability studies, and that sample concentrations are very low. Furthermore, serum samples require intensive sample handling and cleanup prior to analysis by HPLC techniques. The use of microcolumn switching/Capillary HPLC allows direct analysis of samples of biological origin and provides better sensitivity than conventional HPLC.

RESULTS AND DISCUSSION

The direct analysis of xenobiotics from serum with microcolumn switching/Capillary LC is presented by the analysis of a set of widely used anti-epileptic drugs (Figure 1). Five microliters of diluted (1:10) spiked calfserum samples were preconcentrated on a 300 µm I.D. x 5 mm C18, 300Å µ-precolumn. The flow rate for sample loading and clean-up was 50 µL/min. All sample handling experiments were conducted fully automatically.

Figure 1. Identified: D, E, F, G, and H; not identified: others.
with a FAMOS™ micro autosampler. The separation of the anti-epileptic drugs was performed isocratically on a 300 µm I.D. x 15 cm analytical Capillary LC column installed in the valve of the micro autosampler (Figure 2). Detection was at 205 nm on a conventional UV detector equipped with a UZ-View™ Z-shaped capillary flow cell. The sensitivity of micro-column switching/Capillary LC was found to be 30 times better than on-line SPE/conventional HPLC.

Figure 2. Direct analysis of anti-epileptic drugs in calf serum using microcolumn switching/Capillary LC (preliminary results).