

Application info 38

AUTOMATED ON-LINE HPLC ANALYSIS OF CAFFEINE IN COLA

INTRODUCTION

Caffeine (3,7-dihydro- 1,3,7 -trimethyl-1H-purine-2,6-dione) occurs in tea, coffee, maté leaves, guarana paste and cola nuts. Because the last source is one of the ingredients of cola, caffeine occurs in Coca Cola. Caffeine is a well known central stimulant. The need exists to determine its concentration in cola. This application describes the automated on-line HP-SPE and HPLC analysis of caffeine in cola.

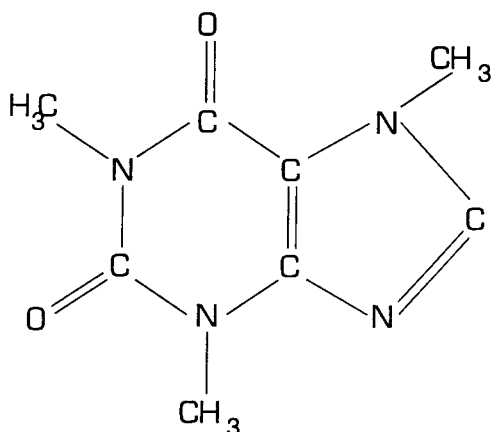


Figure 1: Structural formula of Caffeine

EXPERIMENTAL

INSTRUMENTATION

The chromatographic system consists out of a isocratic Gynkotec 300 pump and a Jasco UV detector. A Solvent Delivery Unit (SDU) which was used for conditioning and purging of the cartridges. A MARATHON autosampler was used for sample injection and a PROSPEKT for the on-line HP-SPE. The last three instruments, from SPARK HOLLAND, function as an integrated system, controlled by sophisticated PROSPEKT programming.

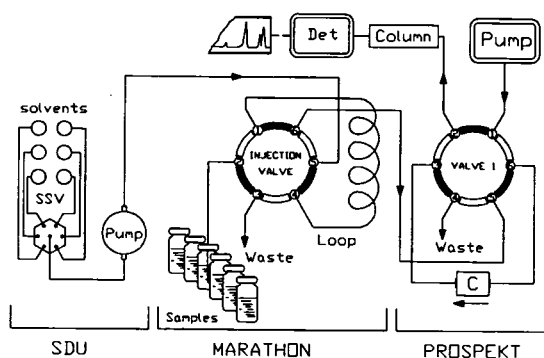


Figure 2: System switching diagram

CHROMATOGRAPHIC CONDITIONS

Anal. column : Chromsep C-18, 10 cm
Cartridge : C18, Analytichem, 40 μ m,
10 \times 2 mm I.D.
Mobile phase : Acetonitril/water (15:85 v/v)
Flow-rate : 0.5 ml/min
Inj. Volume : 20 μ l
Detection : UV, 280 nm.

SAMPLE PREPARATION

Prior to solid phase extraction degass sample solution.

1. Activate 0.5 min with 1.0 ml/min methanol.
2. Condition 1.0 min with 1.0 ml/min water.
3. Load sample 1.0 min with 1.0 ml/min water.
4. Elute sample 1 min with mobile phase.

RESULTS

Figure 3 shows a chromatogram of a cola sample spiked with 120 μ g/ml caffeine.

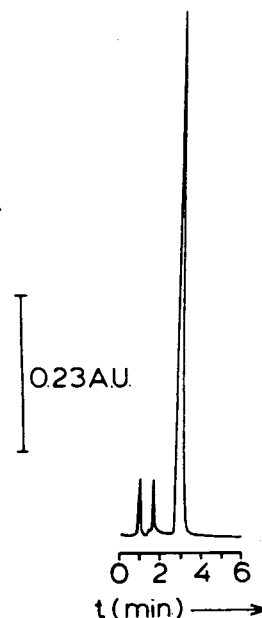


Figure 3: Chromatogram of a spiked cola sample.

After analysis of 20 samples the recovery was 97% with a RSD value of 3.2%.

Carry-over was less than 0.5%

CONCLUSION

An automated on-line SPE-HPLC application has been developed which gives good recoveries and a high reproducibility.

REFERENCE

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