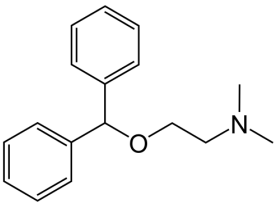
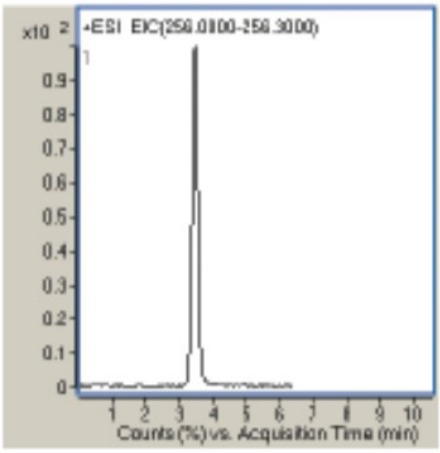
Diphenhydramine HCl

Online SPE with a Simple RP Mobile Phase





Notes: Diphenhydramine (DPH) is an antihistaminic drug mainly used as a sedative, hypnotic and antiemetic most know by the trade name, Benadryl®. It is available over-the-counter in many countries and is very common. Generally regarded as a harmless drug, there have been sixty-eight non-fatal and 55 fatal poisonings with DPH or in combination with other drugs were investigated in the last 10 years.

Method Conditions

Column: Cogent Diamond Hydride™, 4µm, 100Å

Catalog No.: 70000-15P

Dimensions: 4.6 x 150 mm

Solvents: A: DI H_2O/ 10 mM pyridine
B: Acetonitrile/ 10 mM pyridine

Mobile Phase: Isocratic 25%B

Flow rate: 0.4 mL/min

Detection: ESI – neg - Agilent 6210 MSD TOF mass spectrometer

Sample: 50 ng/mL prepared in 50%A/ 50%B

Peaks: 1. Diphenhydramine 256 m/z $(M-H)^-$ RT = 3.49 min

Discussion

When a mobile phase containing 80%B (with 10 mM pyridine in solvent A and B) was used diphenhydramine hydrochloride (DPH) was fully retained on the column. After the mobile phase was changed to the one described above, the DPH peak eluted at 3.5 minutes. This wide range of retention time can give analysts many possibilities of developing methods for quantitative analysis of formulations, drugs and also on column SPE methods for isolation of DPH from complex matrices.

The method above is very reproducible and sensitive with a lower limit of quantitation (LLOQ) of 5 ng/mL for DPH, with good linearity in the range 1-500 ng/mL ($r^2 > 0.9990$).

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