Agilent Technologies

THF with LCMS

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Title: Using Tetrahydrofuran (THF) with LC/MS

Tetrahydrofuran is often used as an additive in reverse phase chromatography, and as a mobile phase for size exclusion chromatography (SEC). It may be used with an LC/MS detector, but its use should be limited for the following reasons:

1. THF is highly flammable and should be used in combination with an aqueous solvent if possible. Particular care should be exercised when using THF with APCI due to the presence of a corona (electrical discharge) in the source.
2. THF is an aprotic solvent and cannot donate a proton for ionization. THF should be paired with a protic mobile phase (i.e. 20-50% water) when possible. The addition of 0.2% acetic acid, 0.1% formic acid or 10-20 mM NH-4OAc to the mobile phase will assist positive mode ionization. The addition of 1% chloroform to the mobile phase will assist in negative mode ionization.
3. THF tends to polymerize in APCI mode. This will cause a loss of sensitivity and fouling of the corona needle. This will not damage the instrument, but corona needles will have to be replaced or cleaned more often compared with alcohol/water mobile phases.
4. THF attacks PEEK tubing. Because the pressures in the LC/MSD sample path are generally below 10-15 bars, the softening of the PEEK tubing with THF is generally not a problem, particularly if the percentage of THF is kept low. However, it is possible to replace the PEEK tubing in the LC/MSD sample path with stainless steel tubing by ordering the following part numbers:

   a. Inlet to selection valve (SSV), 180 mm. Part No. G1313-87304
   b. SSV to nebulizer, 400 mm. Part No. 01040-87602 (380 mm)
   c. Manual Injection Valve to SSV, 140 mm. Part No. G1315-87312 (150 mm)*

*If manual injection valve is present. The extra 10 mm of tubing contributes a negligible increase in pressure and delay volume.