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ITP – CZE - MS

APPLICATION NOTE No. 30

On–line connection of ITP (ITP-CZE) to MS

HOW DOES IT WORKS ?

Sample is analysed in 2-column ITP (isotachophoretic) analyser by ITP-ITP or by ITP-CZE (capillary zone electrophoresis). In the first column sample is separated with high current by ITP. Components at low concentration are concentrated during analysis in very short zones with high concentration (ca 10 mmol)). Macrocomponents are removed after the first column and only microcomponents are separated in the second column (with narrow diameter and longer zones) by ITP or CZE method. Zones are evaluated by conductivity, UV or DAD detectors and than entrer into the block that is connected to MS. Components concentrated in zones are on-line wasched out via quartz capillary to MS.

ADVANTAGES:

- more sensitive than LC-MS
- injected volume up to 100 µl
- matrix is removed during analysis
- sample is concentrated during separation
- new possibilities in ion analysis in complex samples as urine, blood ....

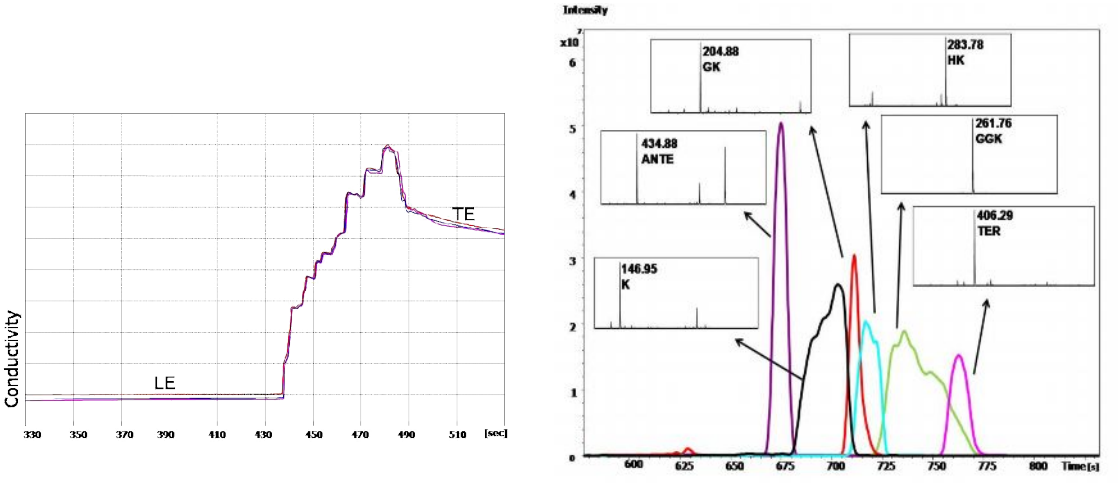


Fig. 1a. Overlay of three consecutive isotachophoretic analyses of cytochrome C tryptic digest . Injected volume 10 µl.
1b. Selected ion monitoring of the cytochrome C tryptic digest.

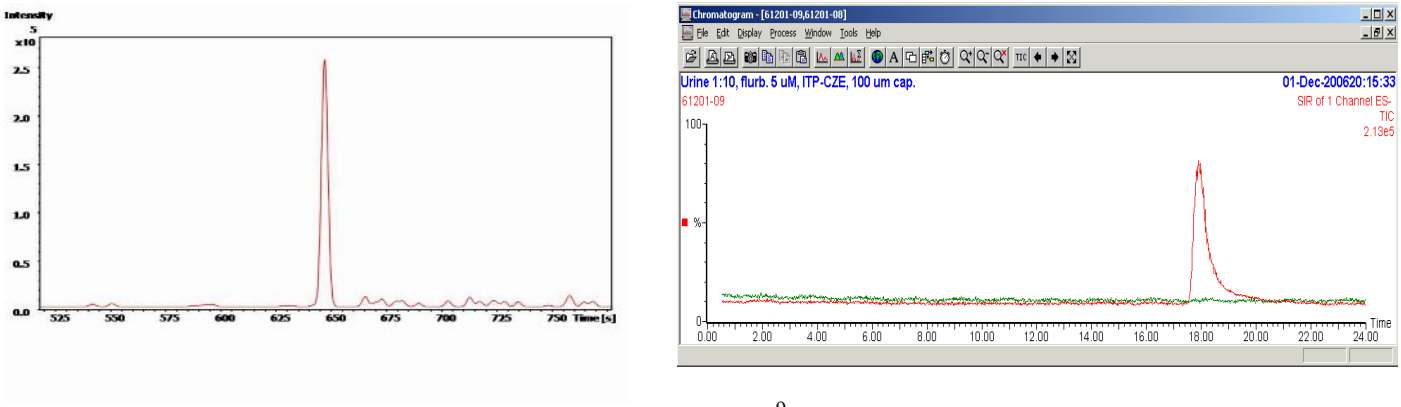
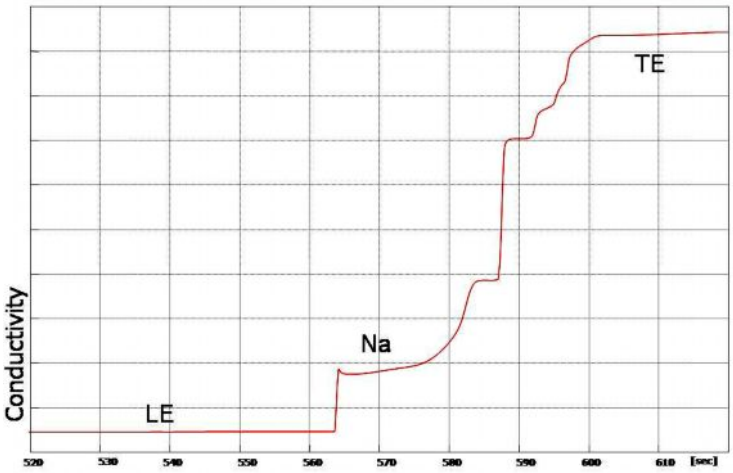


Fig.2. Left: Selected ion monitoring of 1µl, 7.5 x 10^{-9}M thiamine
Right: MS signal from blank and added flubriprofen at concentration 5 micromol in urine. No sample pretreatment was necessary.



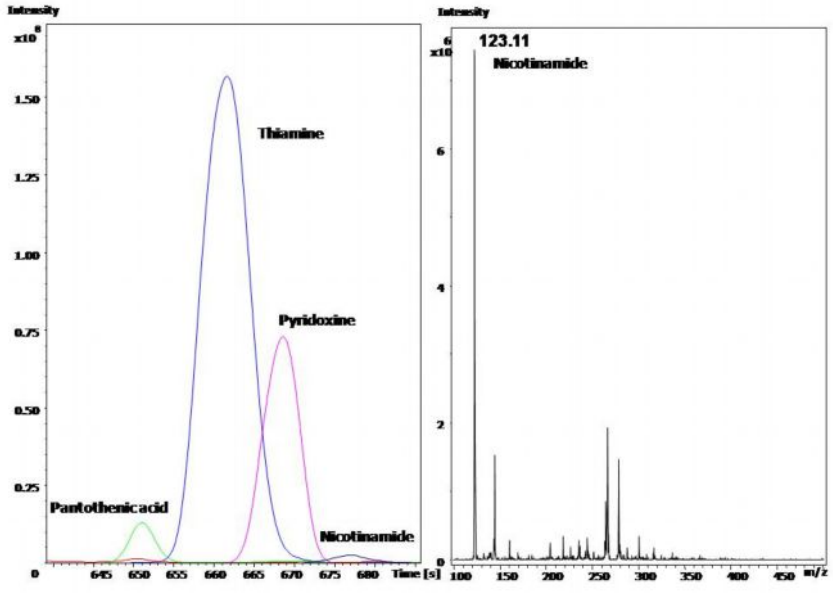


Fig. 3. Upper**:** Conductivity trace of the analysis of 1 µl undiluted blood of person after oral administration of B-komplex vitamin pill.

LE: 10 mM ammonium acetate pH 7.8, TE: 20 mM acetic acid pH 3.5**.**

Lower: Selected ion monitoring of the ions in the ITP zones of undiluted blood.

Literature: R.Tomáš, M.Kovaľ, F.Foret, J.Chromatogr., A (2010) in press.

ITP and CZE analysers are produced by: VILLA LABECO, s.r.o., Chrapčiakova1, 052 01 Spišská Nová Ves, Slovakia, www.villalabeco.sk