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I S O T A CH O P H O R E S I S

APPLICATION NOTE No. 32

FAST and SIMPLE ANALYSIS of IONOGENIC SUBSTANCES in GEL SAMPLES

MAIN FEATURES:

Analysis of ionogenic substances (mainly anions) in gel samples is problematic also due to high viscosity of such samples. Ion chromatography, capillary electrophoresis or another separation technique have problem with injection of such samples.
Isotachophoresis provides very efficient solution of this problem. Gel sample (collagen, gelatine ...) is dissolved in hot water and injected directly to the injection valve („injection position“, see Fig. 2). Injection valve is than turned to the „run position” and analysis is running. Ionic substances migrate into capillary and gel becames solid in injection valve. After analysis the gel is from injection valve pushed out (with higher pressure) and washed out with hot water. If the gel is too solid we can pushed out it mechanically (by means of teflon capillary) because inner diameter of the injection valve is very large (standard 1.5mm). Than the valve is cleaned with hot water. **No sample pre-treatment is necessary, analysis takes ca 5 min.** If concentrations are very low or concentration ratios are too high sample can be analysed in second (analytical) capillary with smaller inner diameter to increase sensitivity. Detection limit for no UV absorbing species is under 1 ppm for UV absorbing ca 100 times better.

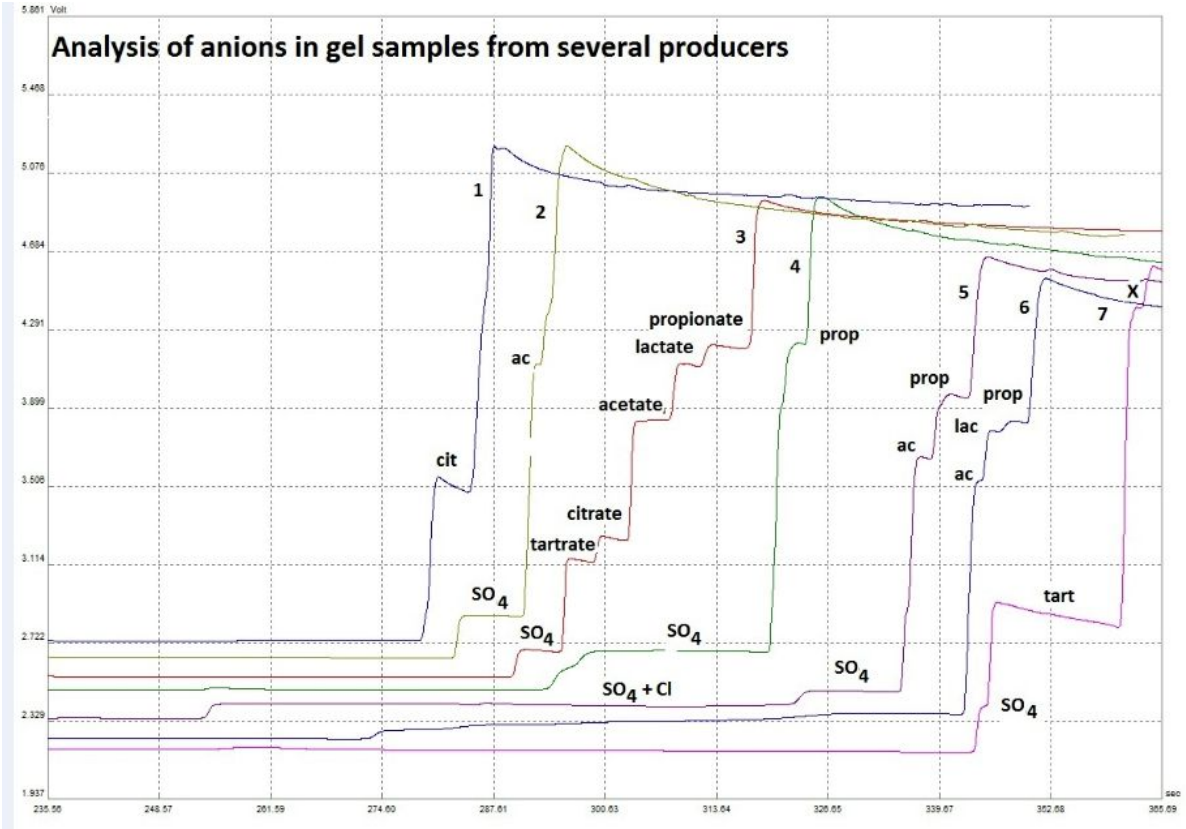

Fig. 1 : Record of gel samples from preseparation column.
1 – LABETA gelatine red (dil. 2000x), 2 – TESCO gelatine (250x), 3 – model mixture 20 ppm,
4 – fish collagen (100x), 5 – fish gelatine (50x) , 6 – OETKER gelatine (50x), 7 – OETKER gele (1000x)

Conditions : leading electrolyte (LE): 10 mM HCl + 18 mM histidine + 0.1MHEC
terminating electrolyte (TE): 10 mM glutamic acid + 10 mM histidine
V = 30 μl, I = 300 μA

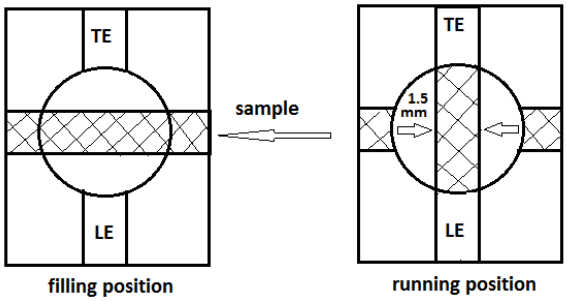

Fig. 2 : Schematic view of the injection valve for injection of the gel samples

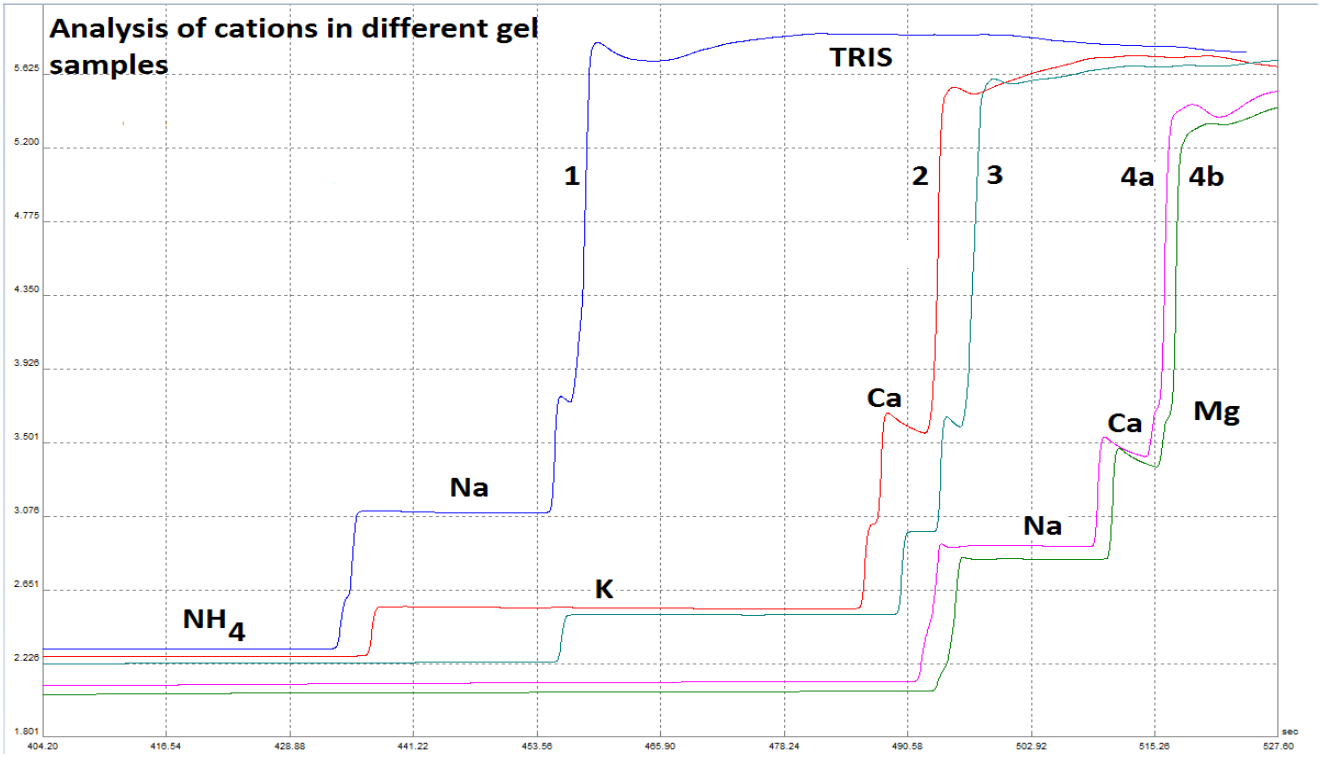

Fig.3. Analysis of cations in gel samples
Conditions: Leading electrolyte (LE): 10mM NH_4OH+acetic acid+30% PEG+0.1% MHEC, pH=5.4
Terminating electrolyte (TE): 10mM TRIS
I = 250μA, V = 30 μl

CZE and ITP analysers are produced by :
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