B001 The effect of metal salts and metal complexes with HDEHP on the separation of carbohydrates by TLC method on Diol-silica plates by the use of anhydrous mobile phase

J. Flieger, H . Szumiło and M. Tatarczak
Department of Inorganic and Analytical Chemistry, Medical University of Lublin. Staszica 6, 20-081 Lublin, Poland.

The present work is concerned with the optimisation of chromatographic conditions for TLC separation of sugars, which occur in nature. The effects of metals (Sr, Ca, Zn, Ni, Cu, Ag) introduced to chromatographic system in the form of salts (1) or complexes with HDEHP and different temperatures (-5ºC, 4ºC, 20ºC, 40ºC, 60ºC) of development have been examined. The analysis of main classes of sugars, mono-, di-, and oligosaccharides (30 compounds) has been performed on Diol-plates by use of non-aqueous mobile phase and single development in the presence of metal ions. Thin layer chromatography was performed on Diol-plates (10 cm x 20 cm), E. Merck (Darmstadt, Germany). The impregnation by dipping was conducted in a glass vessel by immersion of the plates in the 0.2 M salt solution or appropriate complex solution for 1.5 hour. Conditions of the impregnation were established by use of AAS method due to Pye Unicam-SP 192 (Cambridge, UK) single-beam atomic absorption spectrometer (2). The plates were developed in a horizontal DS-chamber (Chromdes, Lublin, Poland) at ambient temperature and in a horizontal DS-chamber adapted for temperature control (patent pending) (3). The carbohydrates in D-form were dissolved (2 mg/mL) in acetone-water (3: 1). Spots were detected by spraying the plates with 0.1% naphthoresorcin in ethanol-20% H_2SO_4 (1:1) and drying for 10 min at 80ºC. Molecular modelling of metal complexes with Diol-plates was performed on dual processor PC graphic station with use of PC Spartan Pro v.1.06 software. Complexes were optimized with semi empirical PM3 method. Obtained retention values are not dependent on the concentration of HDEHP in mobile phase. The concentration of the additive used, however, influences the shape of the spots, which is the best for 2%-3% HDEHP in acetone. Differentiation of selectivity is possible in the case of using HDEHP in complex with metal ions. The best selectivity was obtained on Diol-plates with use of HDEHP-Sr (II) in acetone as mobile phase. Compact spots were also achieved at higher temperatures. This phenomenon is connected with increasing sample solubility.

References: 1. Flieger J. and Szumilo H. (2001) J. Planar Chromatogr. 14: 338-342. **2.** Flieger J., Szumilo H. et al. (2002) J. Planar Chromatogr. (in press). **3.** Dzido T. (2001) J. Planar Chromatogr. 14: 237-245.

B002 New interferometric detector for biomolecular interaction analysis

M. Hartmann [a], P.I. Nikitin b, P. Miethe c and M. Keusgen [a]
[a] Institut für Pharmazeutische Biologie der Universität Bonn, Nußallee 6, 53115 Bonn, Germany. [b] Institute of General Physics, Russian Academy of Sciences, Ul. Vavilova 38, 117769 Moscow, Russia. [c] Senova GmbH, Döbereinerstraße 21, 99427 Weimar, Germany.

Direct optical methods for detecting biological interactions have gained wide acceptance in the recent years (1). They have already become competitive in terms of sensitivity with traditional methods, which use radioactive, enzyme, and fluorescence labels for detecting molecules involved in the biochemical reactions, e.g. potential new drugs derived from nature. In contrast to conventional methods, the newly introduced technology allows a label-free detection in a real-time mode and is therefore a valuable tool for biomolecular interaction analysis (BIA).

During BIA measurement, sample constituents of interest interact with the surface of the bio-layer (Figure 1). This leads to a change in the thickness of this layer, resulting in a change in the phase-difference between the interfering waves (laser light 850 nm). This change causes a shift of the maxima and minima in the interference spectrum, which is used for the measurement of the increase in the thickness of the bio-layer. The newly developed method is highly valuable for a screen on new bioactive compounds, especially those derived from nature.

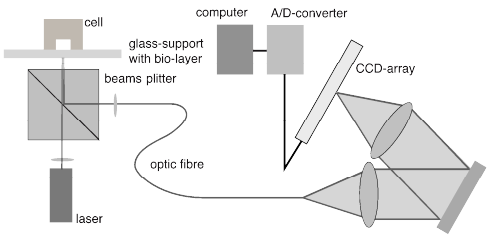

Figure 1. Scheme of the interferometric detector (2).

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