

Multi-cationic aminopyrene-based tag for oligosaccharide analysis by capillary electrophoresis with laser-induced fluorescence detection

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Glycans and oligosaccharides have a great potential in medical diagnostics, but their analysis is challenging due to the complexity and variability of the molecules. Oligosaccharides have a low ionization efficiency important for mass spectrometry and do not contain chromophores or fluorophores for UV/Vis or fluorescence detection. The way to solve these issues is labeling of oligosaccharides with fluorescent labels [1] and their analysis by capillary electrophoresis with laser-induced fluorescence detection (CE/LIF). CE/LIF has the potential as a sensitive and simple method. The most widely used and commercially available fluorescent label is the trisodium salt of 8-aminopyrene-1,3,6-trisulfonic acid (APTS) [2]. Recently, we have synthesized a new multi-cationic aminopyrene-based label, APTMP (4,4',4''-(8-aminopyrene-1,3,6-trisulfonyl)tris(1-methylpiperazine) [3]. In this poster, we present optimization of the labeling and separation conditions to achieve better repeatability and efficiency of labeling as well as detection sensitivity of CE/LIF analysis of APTMP labeled oligosaccharides. Various reaction conditions were tested for example reaction temperature, a type of the reducing agent, a reducing agent/fluorescent tag ratio, and an oligosaccharide/fluorescent tag ratio. The CE/LIF analysis was optimized by testing various background electrolytes (BGE), capillary coatings, separation voltages, and other experimental parameters.

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References

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