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Journal of Chromatography A, 776 (1997) 361

JOURNAL OF CHROMATOGRAPHY A

Discussion

Capillary zone electrophoretic separation of β-blockers using citrate buffer at low pH

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Received 17 December 1996; revised 21 February 1997; accepted 7 March 1997

Keywords: Ionic strength; pH effect; β-Blockers

In a recent contribution to this journal [1], Lin et al. report on the influence of ionic strength and pH on the separation of β-blockers. Although it is not disputed that these two parameters can be of key importance in capillary electrophoresis (CE) optimization, we disagree on the interpretation of the results obtained, because the authors have underestimated the importance of ionic strength and overestimated the effect of pH.

When investigating the effect of pH, ionic strength was not kept constant (as it should have been). In fact ionic strength changed by as much as a factor 17. Not surprisingly, mobilities changed by an average of 30%. These mobility changes can be different for each component, apparently resulting in minor selectivity changes, as seen in Fig. 5.

These selectivity changes certainly cannot be attributed to different extents of ionization, as suggested by the authors, because in the pH range investigated, the components must be considered fully protonated.

In fact the pK values of the β-blockers are 8.8 for pindolol, 9.45 for propranolol, 9.68 for metoprolol [2] and are likely in the same range for the others. Therefore there is no reason to hope for selectivity based on a different extent of ionization of the analytes in the pH range investigated. Summarizing: selectivity effects reported are solely due to minor ionic strength effects.

References

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PII S0021-9673(97)00438-X