ABSTRACT

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Title of Diploma Thesis: Analysis of citrus flavonoids in pharmaceuticals and food supplements by capillary zone electrophoresis.

A method based on capillary zone electrophoresis (CZE) with UV detection for the separation and determination of ascorbic acid and four flavonoids hesperidin, diosmin, rutin and troxerutin was developed. The analysis was carried out in a fused-silica capillary (50 µm i. d., total length 31,2 cm, and length to the detector 21 cm) with UV detection at 280 nm. The samples were injected hydrodynamically at 50 mbar for 6 s. Optimal background electrolyte was 40 mM borate buffer with 25% (v/v) of methanol, pH* 9,5. The separation voltage was 25 kV and temperature 25 °C. Cinnamic acid was chosen as the internal standard. The calibration dependences were linear in the range from 0,05 mg/ml to 0,50 mg/ml for hesperidin (r = 0,9996), diosmin (r = 0,9998), rutin (r = 0,9995), troxerutin (r = 0,9997) and from 0,10 mg/ml to 1,00 mg/ml for ascorbic acid (r = 0,9994). This validated method has been successfully applied for the analysis of commercially available pharmaceuticals and food supplements HemoStop ProBio capsules (s_R = 1,01 – 3,12%); Ascorutin capsules (s_R = 0,57 - 2,36%), Cilkanol capsules (s_R = 2,74%), Detralex capsules (s_R = 0,81 - 2,80%) and Hemodin Prebio Forte capsules (s_R = 1,13 – 4,44%). The single analysis took about 11 min (polycomponent preparations) or below 3 min (monocomponent formulations).

Keywords: capillary zone electrophoresis (CZE), flavonoids, hesperidin, diosmin, rutin, troxerutin, ascorbic acid.