Microfabrication of Microfluidic Cartridge for Isoelectric Focusing by Screen Printing

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A novel microfabrication technique for the preparation of microfluidic cartridges for isoelectric focusing (IEF) by screen printing has been demonstrated. Double parallel strips of polymer coating with a thickness of 50 μm were printed onto a substrate of a thin plastic sheet. Closed channels were made by bonding two units of the printed double strips face to face with epoxy glue, forming a capillary channel with dimensions of 39 × 1 × 0.10 mm. Cartridges suitable for whole column detection (WCD) IEF were fabricated using the printed microchannels. Small molecular mass pI markers and hemoglobins were used as model analytes to demonstrate IEF with WCD in the cartridges. Electroosmotic flow and analyte adsorption were controlled by dynamic coating of the channel with methyl cellulose solution, and good qualitative results have been demonstrated.