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Using ZIF-8 as Stationary Phase for Capillary Electrophoresis Separation of Proteins

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Abstract

Recently, the separation of proteins has received much attention, although many techniques require expensive instrumentation and trained analysts. In this work, a low-cost, effective, and environmental friendship capillary electrophoresis (CE) for proteins separation was first time introduced. The ZIF-8 with outstanding properties of large surface area, and accessible tunnels and cages were coated the inner surface of silica capillary as a separation media by electrostatic interaction. The fast baseline separation of Lys, CC, BSA and RNase A can be obtained within 10 minutes using the ZIF-8 nanocrystals coated capillary column under the optimum separation conditions. Meanwhile, this system showed good reproducibility and stability. Using *L*-glutamic acid as the selector ligand, the *D*- and *L*-phenylalanine were successfully separated by the ZIF-8 nanocrystals coated capillary column. Furthermore, the method was also applied to separate egg white proteins, and three main proteins were separated in a single run.