Abstract

Over the last years, the miniaturization of biochemical analytical tools has become an expanding field. Indeed, such devices allow decreasing both the consumption of analytes and the duration of analyses. This is particular important for the life science developments such as genetic analysis and drug discovery. Comparing to traditional slab gel electrophoresis, capillary electrophoretic methods show an advantage of fast analysis, low sample consumption, high analyzing efficiency, and automation. Recently the developments of chip-based separation devices are increased speed and reliability at reduced sample consumption and cost, particularly microchip electrophoresis.

In this study, a polymeric thin-film microchip for electrophoresis and mass spectrometry was developed. The micro channel is fabricated by micro blade method in PE/PET films, and then sealed by lamination. Because the fabrication without considering the depth of micro channel, it reduces manufacture process from the 3-dimention to 2-dimention in CE chip fabrication. By this way, we take advantage of simply fabrication process and less fabricating time and cost. The characterization of the polymeric thin-film electrophoresis microchip was tested and nanoESI chip was developed according to easy cutting, and sealing of the thin film. Two new types of microchip: four layers microchip and arched microchip were designed for better sample injection. The merits and limitations of those approaches are discussed. To summarize, depending on simplification and rapidity; we looking forward to fabricate high efficiency analytical tools with less time and cost. Therefore, there is also potential for development of disposable diagnostic systems for biomedical applications.