18th International Conference on
World Analytical Chemistry & Mass Spectrometry
&
World HPLC, Separation Techniques & Pharmacovigilance
August 29-30, 2018 | Toronto, Canada

Manufacturing and optimization of a microfluidic device LEGO portable for optical detection-Photonic lab on a chip

Maria Ramos Payan[1], **Adrian Munoz**[2] and **Andreu Llobera**[3]
[1]University of Seville, Spain
[2]Autonomous University of Barcelona, Spain
[3]Technology & Innovation, Germany

LEGO building blocks have been patterned with laser so as to obtain photonic elements which can easily be combined into a Photonic Lab on a Chip (PhLoC). As opposite to the monolithic integration, the building block architecture enable to modify only specific regions of the PhLoC. In addition, it allows to replace damaged parts without a complete breakdown of the system. In this context, different laser writing speeds and conditions have been tested so as to achieve light guides of 500um in width and 500um in depth on transparent LEGO building blocks. Once the optimal writing conditions were achieved, they were used to implement absorbance-based filters using transparent but colored building blocks. Here, it has been obtained stopbands higher than 30dB for blue transparent building blocks, which is the maximum dynamic range of the Maya Spectrometer (Ocean Optics) used. Finally, an experimental set-up was implemented by using a building block as a cuvette and measurements in absorbance and fluorescence were pursued by placing lightguides either at 180° or at 90° from the input light guide. Measurements in absorbance showed a Limit of Detection (LoD) of 0'0171ppm using XXXXX as target analyte. When measuring fluorescence, two different compounds were tested: Fluorescein (LoD of 5.22ppm) and Norfloxacine (22.82ppm). The results presented herein allows confirming the possibility of defining PhLoC building blocks for absorbance and fluorescence measurements.

Biography

Maria Ramos Payan has expertise in improving sample preparation techniques focused on microfluidic-chip devices as miniaturization. The novelty of her microfluidic devices offers more advantages than the existing methodologies. Maria has worked at different institutions (the University of Seville, University of Huelva, University of Lund, University of Copenhagen, University of North Carolina, USA, Microelectronic National Center of Barcelona and University of Autonoma Barcelona). Currently, she works at the University of Seville with the aim of implementing optical detection into microfluidic devices for multiple different applications.

ramospayan@us.es

Notes: