

8th Annual Congress on
Analytical and Bioanalytical Techniques
&
14th International Conference and Exhibition on
Pharmaceutical Formulations

Seungkyung Park et al., Insights in Analytical Electrochemistry, 3:2
DOI: 10.21767/2470-9867-C1-002

August 28-30, 2017 Brussels, Belgium

Aptamer-based detection of arsenite for contaminated soil monitoring

Seungkyung Park, Seungmo Kim, and Dongho Shin
Korea University of Technology and Education, South Korea

Arsenic contamination poses a great threat to the living organisms even in small traces. Conventional methods for analysing heavy metal contamination in soil and water generally require laboratory equipped instruments and complex procedures, and thus have limited applicability for onsite sensing and monitoring of contaminated area. In the present work, we demonstrate the novel miniaturized setup for simple sample preparation and aptamer based optical sensing of arsenite in the contaminated soil. Colorimetric detection protocol utilizing aptamers, gold nanoparticles and NaCl has been optimized and tested on the PDMS chip in 50 ul volume to obtain the high sensitivity. Then the performance of the device is demonstrated through the comparative analysis of arsenic-spiked soil samples with standard laboratory method, and a good agreement is experimentally achieved. The presented method offers the simple, rapid, portable and cost-effective means for onsite sensing of arsenic in soil.

Biography

Seungkyung Park completed PhD in Mechanical Engineering from Texas A&M University, USA. He is the Assistant Professor of Korea University of Technology and Education and his research interests include microfluidics and micro-TAS, point of care testing.

spark@koreatech.ac.kr

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