

Chemiresistive lead sensing using β -Cyclodextrin functionalized rGO films

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Graphene based materials have shown exceptional efficiency in the field of sensing because of its large surface area, high electrical conductivity and the ability to interact with various chemical species. Heavy metal contamination of water has always been a serious threat to us as these heavy metals accumulate in our body and cause long term disorders. Lead (Pb (II)), being one of the most dangerous heavy metals, we explore β -cyclodextrin (BCD) functionalized reduced graphene oxide (rGO) as a chemiresistive sensor material for selectively sensing lead (II) in aqueous medium. Our results show approximately 60% change in resistivity for 50 ppm. The limit of detection of this chemiresistive technique is 1 ppm. A device was fabricated using this material. This sensor device offers practical solution for field detection of lead in case of industrial wastewater.

Figure

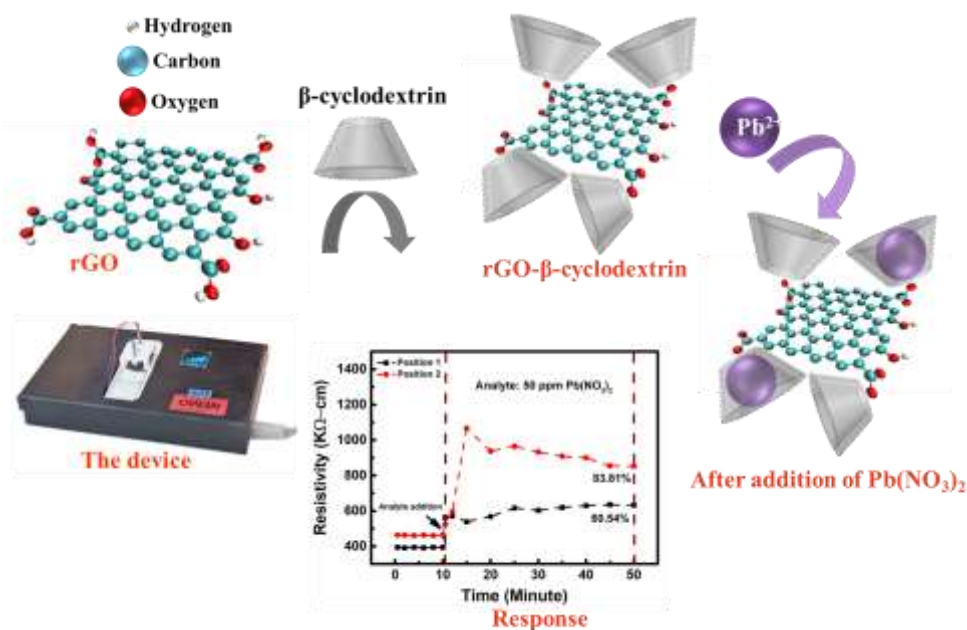


Figure 1: Schematic diagram of the process flow of this study including material under use, chemiresistive response and fabricated device.