The modification of screen printed electrode with Cu-MnO as arsenic sensor

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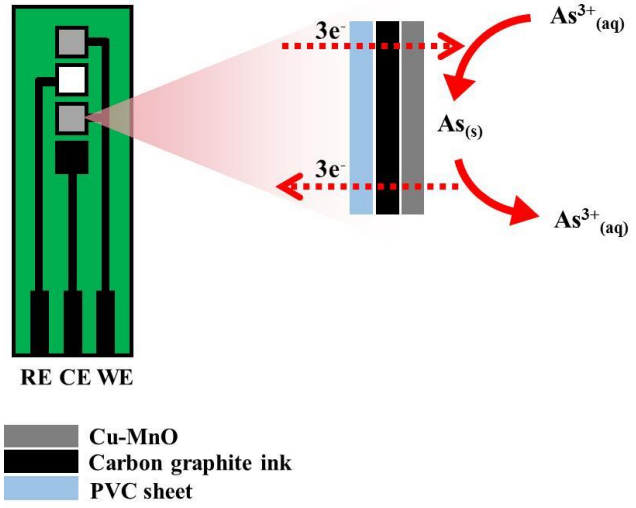
The novel designed screen printed electrodes (SPEs) were created and modified with synthesized copper-doped manganese oxide (Cu-MnO) as electrocatalytic mediator, to determine arsenic (As^{3+}) residue in rice. The synthesized materials were preliminarily confirmed by XRD, FT-IR and SEM-EDX, respectively. An electrochemical performance of the modified SPEs on the detection of As^{3+} was studied by using cyclic voltammetry (CV) and square wave anodic striping voltammetry (SWASV). The results showed that the Cu-MnO catalyzed the redox reaction of arsenic ion on the electrode surface. This led to high sensitivity (8.5 µA/ppm) of the arsenic sensor at ppb level with low detection limit. The Cu-MnO/SPEs exhibited good stability (2.25 %RSD, n=5) and reproducibility (3.23 %RSD, n=5). The developed arsenic sensor was applied to the determination of arsenic in rice samples and calibrated through a validation method, Inductively Coupled Plasma Mass Spectrometry (ICP-MS).



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