

Electrochemical detection of methylamine chemical by well-defined tungsten oxide nanowalls grown by HFCVD technique

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This work explains the growth of well-defined tungsten oxide (WO_3) nanowalls on silicon substrate by the controlled hot filament chemical vapor deposition (HF-CVD) process and directly applied as electrode for electrochemical detection of methylamine chemical. For the growth of WO_3 thin film, the temperature of W wire was kept constant at 1450 °C and then performed the gasification followed by heating of W wire using different substrate temperatures ranging from 350°C - 450°C. The morphological characterization evidenced that well-defined and highly dense nanowalls like structures were grown on Si substrate when the substrate temperature was 400°C. The grown WO_3 films with classic monoclinic crystal structures and good crystal quality confirmed by observing the structural, crystalline and compositional characterizations. The cyclicvoltametry and linear sweep analysis were used to describe the electrochemical sensing behavior of the grown WO_3 film towards the methylamine chemical.