

# Nanostructured Bismuth Oxide EGFET based pH sensors for Water purification

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**Abstract:** The WHO recommended pH value for drinking water lies between 6.5 to 8.5. Due to increasing water pollution day by day, real time monitoring of water become an important aspect for the researchers. EGFET based sensors provide an advantages like easy fabrication, disposable gate, small influence of operating temperature etc. Approach towards fabricating nanostructured material based EGFET sensors taken into account. In present work nanostructured bismuth film has been deposited on the platinum/titanium deposited silicon substrate by the e-beam evaporation method and further heat treatment was given. Nanostructured  $\text{Bi}_2\text{O}_3$  has been characterized by FESEM for observation of morphology. XPS studies have been done in order to observe composition on the surface of the film. Dominant peaks at 163.6 eV and 158.3 eV are corresponding to the  $\text{Bi}_2\text{O}_3$  bonding. The structure and the crystallinity of the film were confirmed by the XRD. Further pH sensing in water was further investigated through the prepared films at different pH i.e. 6, 7, 8, 10 and 12. The film showed a good pH sensing behavior with a sensitivity of 50.55mV/pH. The present results proves the  $\text{Bi}_2\text{O}_3$  films potential candidate for pH sensing in acidic as well as basic medium on EGFET based pH sensor platform.

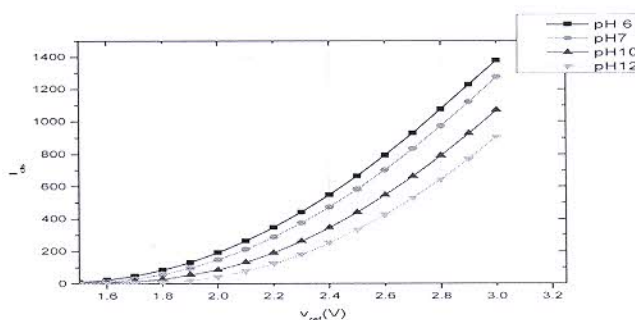
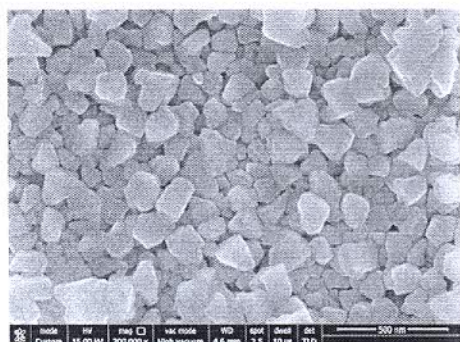


Figure:1 (a) SEM image of the film and Transfer characteristics of the pH sensor

## References

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