**Abstract**

Over the past five decades, there has been an increasing demand for inexpensive, accurate, portable and reliable gas sensors. Gas sensors canbeusedtodetect [combustible](https://en.wikipedia.org/wiki/Combustible), [flammable](https://en.wikipedia.org/wiki/Flammable) and [toxic](https://en.wikipedia.org/wiki/Toxic) gases, and [oxygen](https://en.wikipedia.org/wiki/Oxygen) depletion. Typically, gases of interest include CO, NO, NO2, NH4, SO2, CO2, CH4 and other hydrocarbons. These gases can be harmful to human health if present beyond a certain concentration.Among various metal oxide semiconductors, p-type Cobalt oxide semiconductors are excellent materials for fabricating highly sensitive and selective gas sensors of high-performance.In this study, a novel and low cost chemical route has been developed to synthesize Co3O4 nanostructures. The efficiency of Co3O4 nanomaterials is improved by means of introducingn-type dopants. The synthesized nanomaterials were characterized by different characterization techniques like UV double beam spectrophotometer, X-ray diffraction (XRD), Photoluminescence (PL), Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) andEnergy Dispersive X-ray analysis (EDAX).The Cobalt oxide nanomaterials could have a good response and high sensitivity to CO gas at room temperature.