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## Relative humidity sensor employing tapered Plastic Optical Fiber coated with seeded Al-Doped ZnO

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### Abstract:

A relative humidity sensor operating on intensity modulation principle is proposed and demonstrated using a tapered plastic optical fiber (POF) that is coated with seeded Al-doped ZnO nanostructures. The POF was tapered by mechanical etching and then coated with seeded Al-doped ZnO nanostructures using sol-gel immersion method with different mol % of Al nitrate that acted as dopant. It was found that 1 mol % of Al nitrate produced the best performance compared to other doping concentrations. Then the performances of sensors fabricated using seeded and non-seeded coating methods with 1 mol % of Al-doped ZnO were compared and investigated. The sensor developed using seeded coating method showed a better sensitivity of 0.0386 mV/%, as opposed to the other sensor which registered a sensitivity of 0.0148 mV/%. The results show that tapered POF with Al-doped ZnO

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