

## عنوان مقاله:

Modifying and adjusting features of ZnO-based UV sensors through singly- and co-doping with Ti and Zr using low current sputtering technique

## محل انتشار:

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## نویسندگان:

.Nader Madani-Mashaei - *Department of Physics, Central Tehran Branch, Islamic Azad University, Tehran, I. R. Iran*

Ebrahim Asl Soleimani - *1-Department of Physics, Central Tehran Branch, Islamic Azad University, Tehran, I. R. Iran.*  
*2-Department of Electrical and Computer Engineering, University of Tehran, Tehran, I. R. Iran*

Hamidreza Shirvani-Mahdavi - *Department of Physics, Central Tehran Branch, Islamic Azad University, Tehran, I. R. Iran.*

## خلاصه مقاله:

The possibility of modifying and adjusting the properties of ZnO-based sensors in the post-fabrication stage is demonstrated by singly- and co-sputtering of ZnO thin films with zirconium and titanium nanoparticles. First, thin films of zinc oxide are created on glass substrates by sol-gel process and spin coating, and some of these films are converted to UV sensors through electrode placement on them by thermal evaporation method. Then, a number of the initial detectors are singly- and co-doped with Ti and Zr using sputtering deposition technique. Experiments show that the modification and adjustment of the parameters of the sensors through low current sputtering technique (LCST) is possible more efficiently and controllably. The transient response of all sensors are measured using I-t tests with periodic UV illumination before and after sputtering. Comparison of the results before and after doping shows that the photoresponsivity is improved on all doped sensors, and in many cases, a simultaneous improvement in this quantity and rise time is observed. In the best-case scenario, relative to undoped sensors, the photoresponsivity of the sensors doped with zirconium increases by more than ۴۲۹ times, while the rise time of the sensors co-doped with titanium and zirconium decreases to less than ۵۰%. This experience indicates that the modification and adjustment of the properties of ZnO-based sensors and actuators after electrode placement, to a large extent, is possible through LCST. It is noteworthy that this can be performed depending on the need and selectively in the shortest time, at the lowest cost.

## کلمات کلیدی:

Surface sputtering technique, Transient response, Photoresponsivity, Rise time

## لینک ثابت مقاله در پایگاه سیویلیکا:

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