One-step synthesis, characterization, and visible light photocatalytic activity of pure and Zn-doped SnO2 nanoparticles

In order to confirm the substitution of Zn into SnO_2 sites, the simples were characterized by UV-Vis transmission spectra analysis, because Zn doping decreases the band gap of SnO_2

Sample preparation

Pure and Zn-Doped SnO_2 nanoparticles were prepared using a 0.1M solution of $SnCl_2 \cdot 2H_2O$ in deionized water and 0, 5 and 10 wt% of $ZnCl_2 \cdot 2H_2O$ in deionized water was added to the solution and the pH was adjusted to 8 with the addition of 2ml of NH_4OH. The precipitate was irradiated for 15 min in air atmosphere on a 360W, 4.5GHz household microwave.

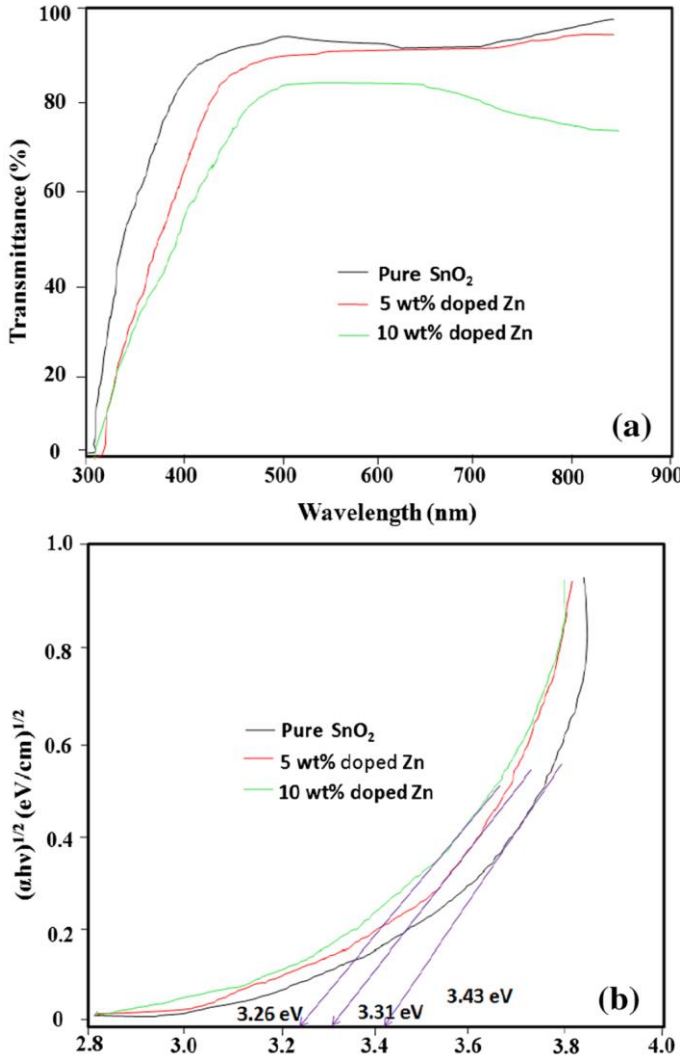
Data acquisition conditions

The spectra was acquired in the 300 to 850 nm range

Conclusions

The effect of the amount of Zn doping on the bandgap energy of the SnO2 nanoparticles are shown on the following table

Wt% of Zn doping	Bandgap energy (eV)
0	3.43
5	3.31
10	3.26



UV–Vis spectra of SnO2 nanoparticles with different Zn content
(a) transmittance spectra (b) bandgap energy determination

Madhan, D., Rajkumar, P., Rajeshwaran, P., Sivarajan, A., & Sangeetha, M. (2015). One-step synthesis, characterization, and visible light photocatalytic activity of pure and Zn-doped SnO_2 nanoparticles. Applied Physics A: Materials Science and Processing, 120(2), 463–469. https://doi.org/10.1007/s00339-015-9240-y