Materials science and engineering for nanoparticles

Weam Sidahmed Awadalla Sidahmed
University of Khartoum, Khartoum,

This research aims to study an effect of annealing Nano size titanium dioxide (Ti), Titanium dioxide (Ti) is a wide gap oxide semiconductor is an n-type due to oxygen deficiency. It has three phases of the crystal structures including anatase, brookite, and rutile, where the band gap is 3.2 eV for brookite, 3.2 eV for anatase, and 3.0 eV for rutile. The most stable form and the principal source of (Ti) are rutile. The metastable anatase and brookite will transform to the thermodynamically stable rutile upon calcination at temperatures exceeding 600oC. In all three forms, titanium (Ti) atoms are coordinated to six oxygen atoms, forming (Ti) octahedra. Utilize six grams of (Ti) material beige color was tope down divided for two parts one was annealed to 600oC for 4 hours and another let without annealing. The as-prepared samples were further characterized using devices studying (Ti) properties, X-Ray Diffraction (XRD), Fourier Transformation Infrared Red (FTIR) and USB Spectrometer. As 0.25g from both samples was taken and put in (FTIR) to reading transmission and absorption properties, 0.5g was taken for two samples put in (XRD), and 0.25g from both samples was taken and used UV-Visible Spectroscopy (USB) to take the readings. After the properties of the annealed sample were studied and compared to the raw (control powder), this properties were found that the colour of the Titanium Dioxide has changed from beige into white as the last one showed fewer impurities and formed Ti-O-Ti vibrational mood which was absent in the control sample. The band gap was recorded and found to be 2.567 eV and 2.568 eV for control and annealed samples respectively.

Biography

Weam Sidahmed is an independent researcher who received her M.Sc. in Renewable Energy at the University of Khartoum, and studying M.Sc. in Business Administration in second semester at University of Khartoum, and B.Sc. Faculty of Science Department of Physics (Mathematical Section). Her work experience includes research and teaching posts in the Sudan since 2016, she teaches at several Sudanese higher education institutions (University of Khartoum, Ribat University) and serves for NGOs in Sudan. She is a conferences organizer, presenter and proceedings editor, and is engaged in collaborative research with global and social perspectives. She is a committee member and from team founding of Next Einstein Forum in Sudan and organized conference the Sudanese Women in Science and organized (2018-2019) Sudan Robotic Camp for kids (2018-2019), now she is programer director. Team member of Sudan Youth Organization on Climate Change. She attended much local and global conference about Materials Science and engineering and nanotechnology.