

Photoelectric Properties of Selenium

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Abstract

The purpose of the research is to determine the energy gap for the gray Selenium using two different methods. The amorphous Selenium thin films were prepared with different thicknesses using thermal evaporation method on glass. These films are amorphous, due to grains formation. The experimental band gap is measured using the spectrophotometer and was found to be 1.9 eV. Theoretically, we used WIEN2K package to find the electrical properties of Selenium, and energy gap. We obtained an energy gap of 1.3 eV using the Generalized Gradient Approximation 2008. From the band structure, it is quite obvious that the band gap is indirect. Moreover, we

implement the more precise approximation, namely the Modified Becke Johnson method to calculate the energy gap of Selenium.

Biographies

Dr. Maamar Benkraouda's main research interest is in electronic and optical properties of materials and their applications. Dr. Maamar Benkraouda has a PhD in Physics from Iowa State University, Ames, USA, and has a MSc in applied mathematics from the same university and a MSc in physics from the University of Minnesota, MN, USA. He also holds a BSc in Physics. Prior to joining the UAE University, he was a postdoc at Ames National Lab in the US.

Mohamed El-Shaer was born in Cairo in 1966, He received his bachelor's degree from Helwan University in Cairo in physics and his master's degree in 1994 from Helwan University. His work at that time focused on atomic spectroscopy in National Research Center. After that in 1996 he joined UAEU and until now he is working in research labs of physics department and his work focused on semiconductor devices and gas sensors.

Hisham Mohammed Ahmed Hassan. I am a Sudanese nationality who born and raised in Al Ain, Abu Dhabi, United Arab Emirates in 18th of June 1990. I Joined Al-Jimi school since 1997, then I moved to Meawya, and Zayed schools until I graduated in 2008. I joined United Arab Emirates in year of 2009 and I attached the college of science, Department of physics as a major. My minor is Information Technology. Physics has always been a challenge field, and this is the main reason why I attached the physics department, in addition, my high school teachers played a main role to motivate me to join a computational field, plus it is applied in real life.

Hossam AlDeen Yousef was Born in Madaba, Jordan in 9th March 1992. I was raised in Al-Jiza, and I studied in UNRWA school until the 9th grade. At the tenth grade I moved to the secondary comprehensive school in order for me to compete for one of three positions to get a scholarship that will help me obtain a scholarship. After my high school, I was able to win a scholarship the United Arab Emirates University to study physics as major and minor in information technology. I am now in my 3rd year of physics and I plan to continue my graduate studies in physics in a world class university.

Ali Safaa Qarani. I was born and raised in Al Ain city which is located approximately 160 km east of the capital Abu Dhabi. I'm originally from Iraq, more specifically from Erbil, a city located in the north of Iraq and the capital of Kurdistan Region. From a very young age, physics and math have always been subjects that I am extremely passionate about. Back when I was in school it was Physics that captured my imagination, as I've grown the world of Physics has become the forerunner for my attention. It is largely through Physics that the world has revolutionized into something that would have been unfamiliar less than a decade. Therefore, I decided to major in physics and currently I am studying at UAE University. Furthermore, my aim is to continue studying physics by doing Masters and PHD degree.

Ahmed Benkraouda was Born in Ames, Iowa, USA in 1996. I studied elementary and secondary at Sanawbar school in Al Ain, UAE and finished my high school at the international school of Choueifat, Al Ain, UAE. Presently, I am a mechanical engineer sophomore at the United Arab Emirates University.