



All calculations are based on spin polarized density functional theory using the code Vienna *ab initio* simulation package (VASP) employing generalized gradient approximation (GGA) for the exchange-correlation energy. We consider the model of a slab and an oxygen molecule. Details will be discussed at the meeting.

## **P-52 Novel AZO Thin Film for Display and Photovoltaic Application**

*Agus Geter Edy Sutjipto, Jufriadi, Riza Muhida, Raihan Othman*  
*Manufacturing and Materials Engineering, Kulliyah of Engineering*  
*International Islamic University Malaysia*

AZO is an ideal replacement transparent conducting oxide (TCO) for ITO to display and photovoltaic applications. The typical applications include: transparent electrodes for solar cells, flat panel displays, LCD electrodes, electro-magnetic compatibility (RF-EMI shielding) coatings, touch panel transparent contacts, static discharge dissipation. The production of useful and commercially attractive thin films using different deposition processes is very important parameter to investigate. A systematic study of the sputtering condition and their influenced on electrical and structural were studied. In this work, AZO films were deposited by RF magnetron sputtering at 200 Å°C. The result shows that the deposited time has influenced the characteristic of deposited AZO films. For a longer deposition time, thin film shows a uniform grain growth. The resistivity found minimum at the deposition time of 45 minutes. It can be considered that by reducing of the grain boundaries which enable the electron carries to conduct smoothly.

## **P-57 Fatty Acid, Mineral and Heavy Metal Contents of Different Malaysian Fish Species**

*Irwandi Jaswir, Farida Osman, Ridzwan Hashim, David D. Kitts, Jalal A. K. Choudhury*  
*Department Biotechnology Engineering, Kulliyah of Engineering*  
*International Islamic University Malaysia*

Fish are popularly recognized as an excellent source of lipids that are composed of a wide range of important fatty acids. Fish also contain good quality protein and are an adequate source of many vitamins (e.g. fat soluble A, D, E and the water soluble B-complex), in addition to important minerals such as calcium and phosphorous. We recently investigated the fatty acid (FA) profiles, mineral and heavy metal contents of 13 different species of commonly consumed, wild marine fin-fish found off Langkawi Island, a popular Malaysian tourist destination. The fish species were “jenahak” (*Lutjanus agentimaculatus*), “kebasi” (*Anadontostoma chacunda*), “duri” (*Arius cumatranus*), “tenggiri batang” (*Scomberomorus commersonii*), “kembong” (*Rastrelliger kanagurta*), “kintan” (*Psettodes crumei*), “kerisi” (*Pristipomoides typus*), “kerapu” (*Epinephelus sexfasciatus*), “gelama keling” (*Sciaena dussumieri*), “malong” (*Congresax talabon*), “laban” (*Cynoglossus lingua*), “yu 9” (*Scolidon sorrakowah*) and “bagi” (*Acanthurs nigrosis*). The overall findings reveal that all fish showed a considerable amount of unsaturated fatty acids particularly those with 4, 5 and 6 double bonds. Two physiologically important n-3 polyunsaturated fatty acids (PUFAs), i.e. eicosapentaenoic acid (EPA) and docosahaexaenoic acid (DHA), made up more than 50% of the total PUFAs. It can be concluded that fin fish found in Langkawi Island coastal areas are beneficial for human health as they have considerable amounts of PUFAs, especially AA and DHA fatty acids. In the case of heavy metal analysis, the result reveals the safety of the consumption of fish from the human health point of view.