spherical globules. The copolymer, on the other hand, displays large flake like structures formed due to agglomeration of irregular shaped globules.

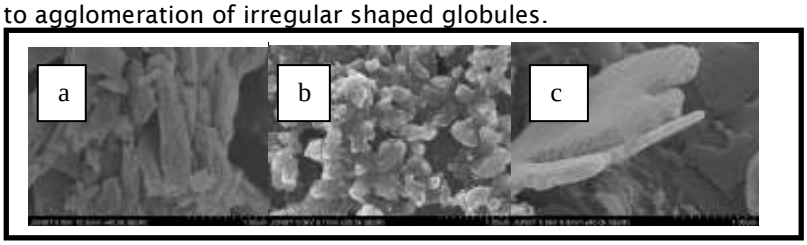

Figure 1. FESEM images of (a) PANI, (b) PPY and (c)PANI-PPY copolymer synthesized using oxidant APS

Figure 2 shows the FESEM images of PANI, PPY, PANI-PPY copolymer synthesized using $CuCl_2$ as oxidant. In this case, PANI samples are in form of spherical globular agglomerates. The PPY samples are in the shape of irregular shaped globules of the order of 100 nm or less. The most interesting results are the PANI-PPY copolymers which have a rod like structure of size ~ 500nm with a sharp pointed end.

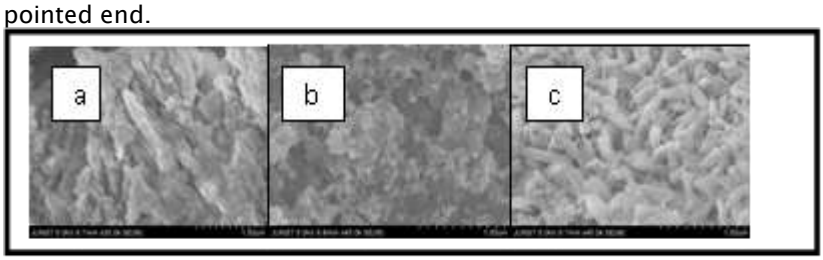

Figure 2. FESEM images of (a)PANI, (b) PPY, (c) PANI-PPY copolymer synthesized using $CuCl_2$

Analysis of the morphology of PANI, PPY, PANI-PPY copolymer thin films have shown that the oxidant has a definite role in determining the structure of the polymers in vapor phase polymerization technique. Moreover the copolymers show significantly different structures from their parent polymers. The results presented in this article indicate that further investigations of the properties of these copolymers should reveal many new and interesting facts about this yet unexplored copolymer thin film.

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Thickness-dependent electrochromic properties of amorphous tungsten trioxide thin films

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Tungsten Trioxide (WO_3) thin films were grown by thermal evaporation method to study the effect of film's thickness on its electrochromic (EC) properties. The WO_3 thin films of different thicknesses were grown on Indium Tin Oxide (ITO) coated glass and soda lime (bare) glass substrate held at room temperature. The surface composition of the thin films was investigated using X-ray photoelectron spectroscopy measurement, which showed the oxygen to tungsten atomic composition ratio to be nearly 2.97. The EC properties of the thin films were examined using electrochemical techniques. Cyclic-voltammetery shows the diffusion coefficient (D) of the intercalated H^+ ion in the WO_3 thin film increases with the film's thickness. It turns out that the 'thicker' film exhibits better coloration efficiency (CE) as compared to the 'thinner' film. The coloration time was found to be independent of film thickness; however, the bleaching time increases as the film thickness increases.

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Graphene Oxide based Ethylene Gas Sensor for e-Nose Application

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Multilayer graphene oxide (GO) is prepared by well-known Hummer's method from pure graphite powder and characterized structurally by XRD, FESEM and Raman spectroscopy analysis. A conductive type GO based pellet sensor has been fabricated and response of the sensor in presence of ethylene gas when emitted by different fruits has been studied in a closed chamber at room temperature. The results show that, the conductivity of the sensor changes depending upon the amount of ethylene gas emitted from the fruit kept in the sensing chamber and thus our sensor can clearly identify different fruits. Moreover, for a particular fruit, it can differentiate an unripe, a ripe and an over ripe fruit.

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In situ synthesis of ZnO nanorod modified visible light emitting and high dielectric PVDF thin film

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A facile and low cost ZnO nanorod (NR) modified piezoelectric and visible light emitting poly(vinylidene fluoride) (PVDF) thin film with improved dielectric property has been prepared via in situ process using dimethyl sulfoxide (DMSO) as solvent and reducing agent. The formation of ZnO NR are investigated using X-ray diffraction and UV-Visible spectroscopy. UV-Visible spectrum of the nanocomposite film shows a strong absorption peak at 367 nm. The morphology and distribution of the ZnO particle in PVDF matrix is investigated by field emission scanning electron microscopy. A remarkable improvement in piezoelectric β phase nucleation (~80 %) and the dielectric constant (ε~50) have been observed in the nanocomposite. The interface between the polymer chains and the NRs leads a critical role in the increment of the β phase and the dielectric constant of thin film. Strong electrostatic interaction or ion-dipole interaction among the NRs and the PVDF matrix is the reason behind the enhancement of β phase nucleation and dielectric constant. The semiconducting ZnO NRs-PVDF also shows strong emissions peaks in between 400-560 nm when it excited by UV light. Thus, the semiconducting film may has a potential application possibilities for developing energy storage devices like thin film capacitors, solid electrolyte batteries, photovoltaically self-charging power cells, piezoelectric nanogenerators, UV shielding and sensors.