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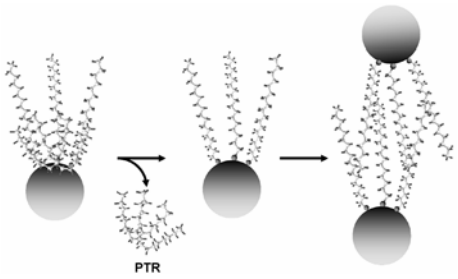
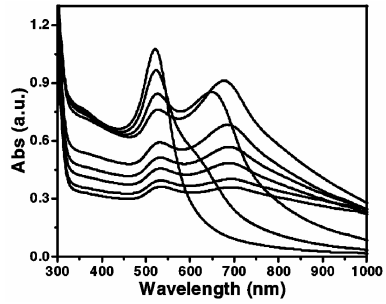
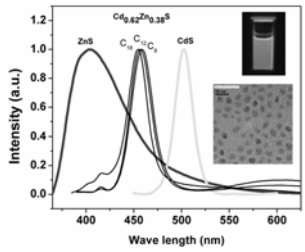
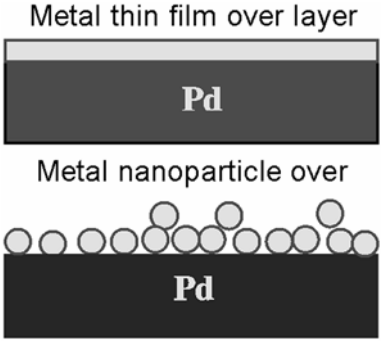
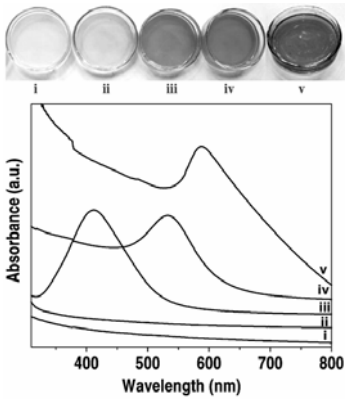
Special issue on New Directions of Research in Molecules and Materials



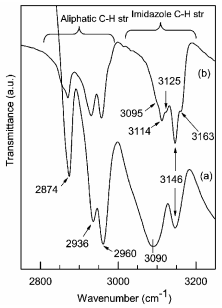




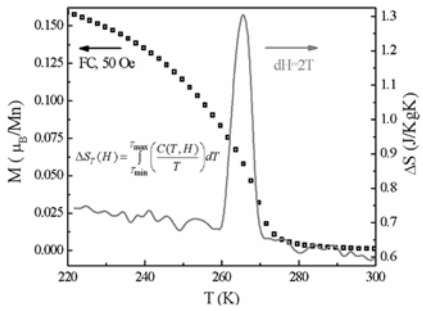




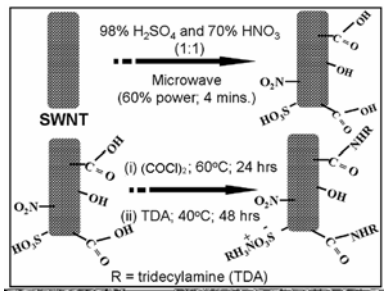
We have reported here a simple procedure for the preparation of metal, semi-conducting nanoparticle composite films by using naturally occurring biopolymer, agarose, as the matrix. Ag and Cu nanoparticles composite films show high antibacterial activity against *E. coli* bacteria. These agarose-metal-nanoparticle films can be easily converted into catalytic metal–carbon composites by carbonization.



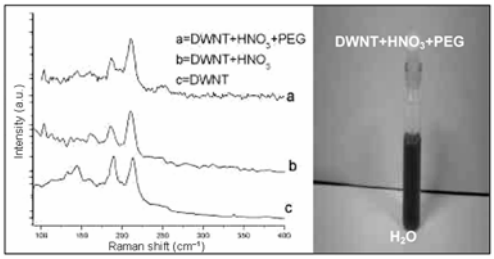
Results from FTIR, near IR and ^{31}P MAS NMR establish electrostatic interactions between $BmIm^+$ cations and large Keggin anions present in the hybrid molecular material formed between ionic liquid and polyoxometalate. The two C–H stretching peaks of the imidazole ring in BmImBr are split into five vibrational peaks in the hybrid salt.

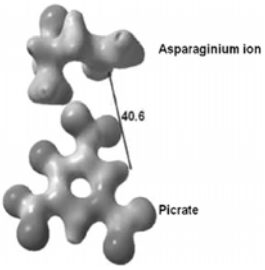


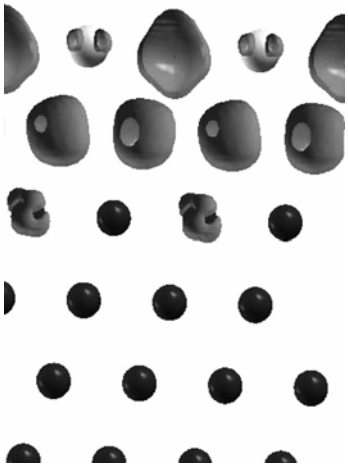
Magnetocaloric effect has been studied across a first order structural transition coupled to the ferromagnetic transition ($T_C \sim 270$ K) in $Pr_{0\cdot1}Ce_{0\cdot4}Sr_{0\cdot5}MnO_3$ using magnetization and heat capacity measurements. The adiabatic magnetic entropy change $|\Delta S|$ obtained from magnetization and heat capacity measurements for a magnetic field change of 2 T is around 1·3 J/kg K.

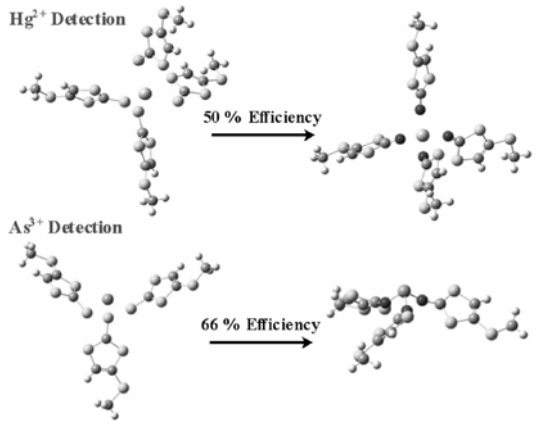


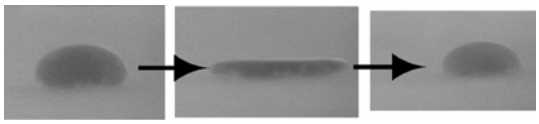
A clean and higher degree of amidation is achieved using oxalyl chloride preceded by microwave treatment in acid mixture. A maximum of 30 wt% of oxygenated groups have been generated on the side walls by rapid microwave treatment, leading to a solubility of 2·6–5 mg/mL in water.

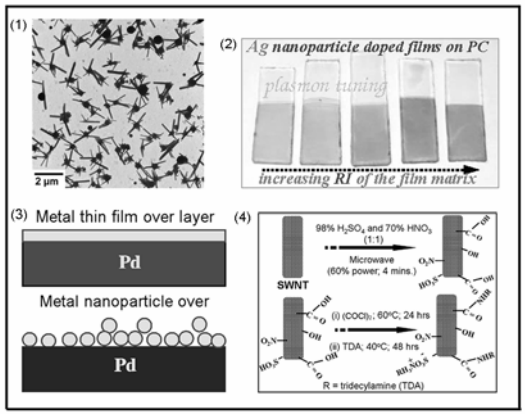












Cover picture: (1) Nanostructured phosphomolybdates. For details see the paper by J Thomas *et al* (pp 529–536). (2) Ag nanoparticle doped films on PC. For details see the paper by S K Medda *et al* (pp 565–572). (3) Metal nanoparticle and thin film over layers. For details see the paper by M Khanuja *et al* (pp 573–578). (4) Phase transfer of SWNTs by covalent functionalization. For details see the paper by B Kakade *et al* (pp 599–606).

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