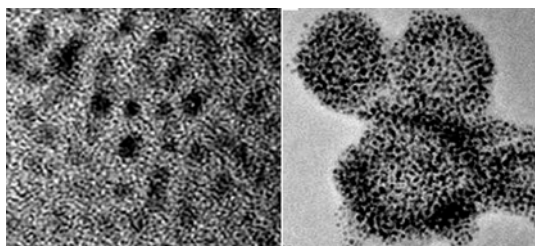


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Special issue on New Directions of Research in Molecules and Materials

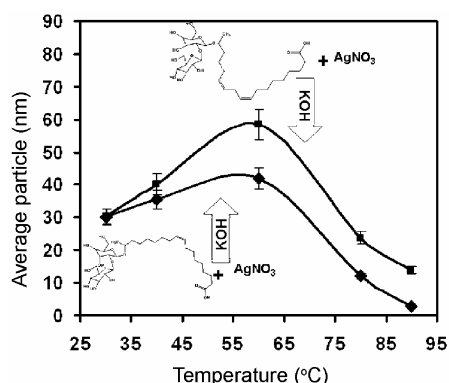
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Facially amphiphilic thiol capped gold and silver nanoparticles

Shreedhar Bhat and Uday Maitra 507–513

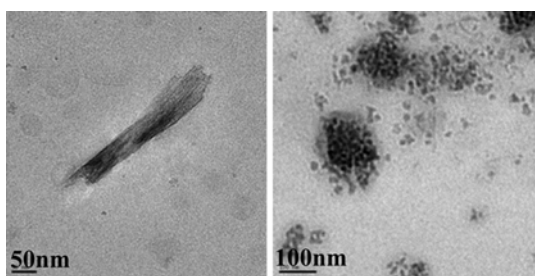
Au and Ag nanoparticles are stabilized by bile acid derived thiol capping. They self assemble in aqueous solvents due to the amphiphilic nature of the capping agent.



Synthesis of silver nanoparticles by sophorolipids: Effect of temperature and sophorolipid structure on the size of particles

M B Kasture, P Patel, A A Prabhune, C V Ramana, A A Kulkarni and B L V Prasad 515–520

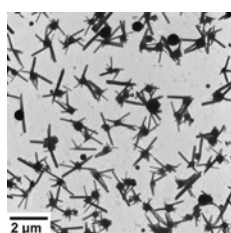
The dual reducing and capping nature of bio-surfactants called *sophorolipids* has been utilized to synthesize *in situ* sophorolipid capped silver nanoparticles. Particle size and distribution varies with reaction temperature leading to approximately monodisperse particles at higher temperatures.



Role of carboxylate ion and metal oxidation state on the morphology and magnetic properties of nanostructured metal carboxylates and their decomposition products

Aparna Ganguly, Rituparna Kundu, Kandalam V Ramanujachary, Samuel E Lofland, Dipankar Das, N Y Vasanthacharya, Tokeer Ahmad and Ashok K Ganguli 521–528

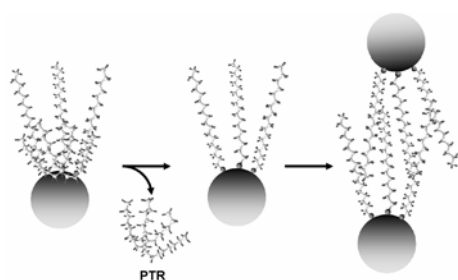
Polycrystalline metal–organic hybrid nanostructures (nanorods and nanoparticles) of dicarboxylates were synthesized by the reverse micellar route. The oxidation state of the metal ion is found to control the morphology of the nanostructured Co and Fe-succinates.



Nanostructured phosphomolybdates

J Thomas, K R Kannan and A Ramanan 529–536

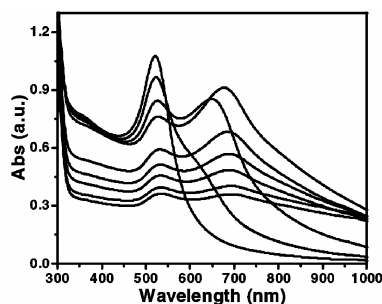
Phosphomolybdate nanorods were synthesized using dodecyl pyridinium cations as structure directing agent. The effect of synthetic variables such as pH and nature of templating agent on structure and morphology of the nanorods under ambient condition has been investigated.



Removal of phase transfer agent leads to restricted dynamics of alkyl chains in monolayer protected clusters

V R Rajeev Kumar, R Mukhopadhyay and T Pradeep 537–546

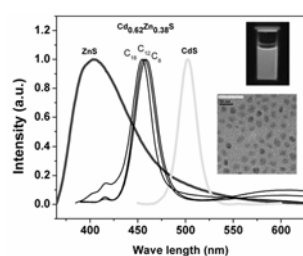
Repeated precipitation of thiolate monolayer protected gold clusters made the alkyl chains defect-free. This reduced the mobility of the monolayers which is reflected in the ^{13}C and ^1H NMR line-widths. The presence of phase transfer reagent affects the dynamics of isolated clusters and interdigitated monolayers in different ways.



p-Aminoacetanilide mediated formation of assembly of Au nanoparticles

Subhojit Das, A Murugadoss, Santu Sarkar and Arun Chattopadhyay 547–555

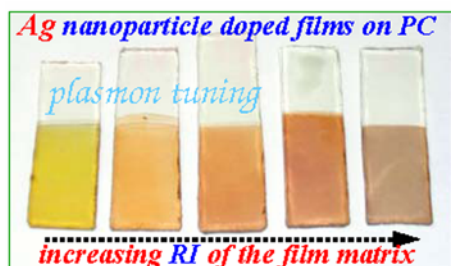
Size selected aqueous nanoparticles are organized into linear arrays, with tunable optical properties, using *p*-aminoacetanilide.



Synthesis and spectroscopic study of high quality alloy $\text{Cd}_x\text{Zn}_{1-x}\text{S}$ nanocrystals

Suparna Sadhu and Amitava Patra 557–564

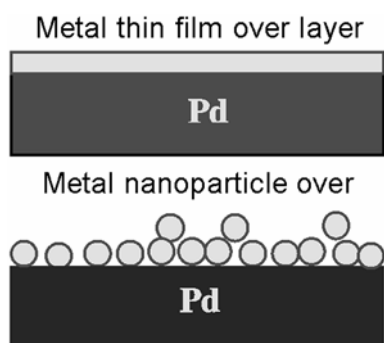
The synthesis of high quality of $\text{Cd}_x\text{Zn}_{1-x}\text{S}$ alloyed nanocrystals and the study of their radiative and non-radiative relaxation with changing the composition by time resolved spectroscopy have been presented.



Tuning of Ag-SPR band position in refractive index controlled inorganic–organic hybrid $\text{SiO}_2\text{--PEO--TiO}_2$ films

Samar Kumar Medda, Moumita Mitra and Goutam De 565–572

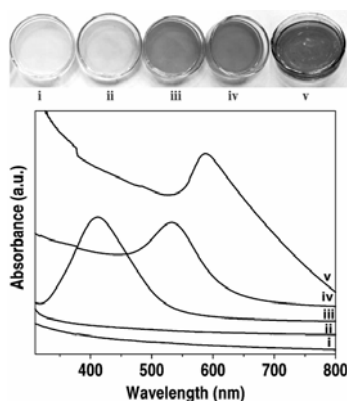
Ag nanoparticles were generated *in situ* inside the refractive index controlled inorganic–organic nanocomposite films to develop coloured coatings through the plasmon tuning of Ag-NPs. The systematic change of Ag plasmon position with respect to the refractive index of the matrix yielded yellow, yellowish-orange, orange, brownish-orange and orangish-brown coloured coatings.



Two approaches for enhancing the hydrogenation properties of palladium: Metal nanoparticle and thin film over layers

Manika Khanuja, B R Mehta and S M Shivaprasad 573–578

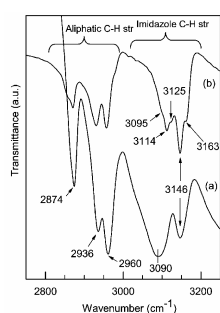
Two approaches have been used for enhancing the hydrogenation properties of Pd: (1) metal thin film (Cu, Ag) has been deposited over Pd and (2) Ag metal nanoparticles have been deposited over Pd. Alloying between Ag and Pd is suppressed in case of Ag(nanoparticle)/Pd(thin film) bimetallic layer on annealing as compared to Ag(thin film)/Pd(thin film).



Synthesis of agarose–metal/semiconductor nanoparticles having superior bacteriocidal activity and their simple conversion to metal-carbon composites

K K R Datta, B Srinivasan, H Balaram and M Eswaramoorthy 579–586

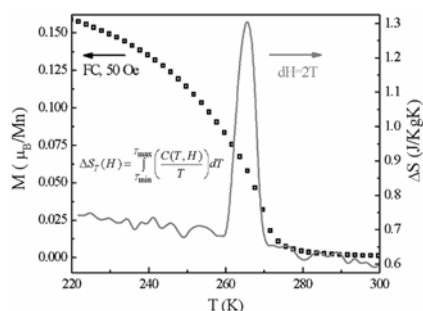
We have reported here a simple procedure for the preparation of metal, semi-conducting nanoparticle composite films by using naturally occurring biopolymer, agarose, as the matrix. Ag and Cu nanoparticles composite films show high antibacterial activity against *E. coli* bacteria. These agarose-metal-nanoparticle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



Investigation of hybrid molecular material prepared by ionic liquid and polyoxometalate anion

T Rajkumar and G Ranga Rao 587–594

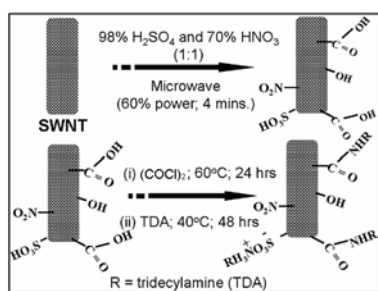
Results from FTIR, near IR and ³¹P MAS NMR establish electrostatic interactions between BmIm⁺ cations and large Keggin anions present in the hybrid molecular material formed between ionic liquid and polyoxometalate. The two C–H stretching peaks of the imidazole ring in BmImBr are split into five vibrational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



Magnetocaloric effect across the coupled structural and ferro-magnetic transition in Pr_{0.1}Ce_{0.4}Sr_{0.5}MnO₃

C Madhu and A Sundaresan 595–598

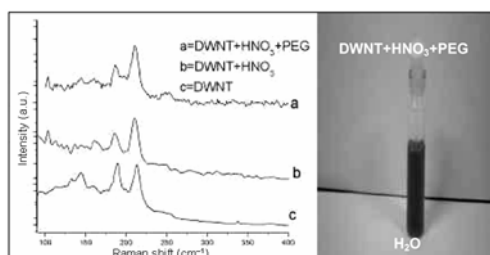
Magnetocaloric effect has been studied across a first order structural transition coupled to the ferromagnetic transition ($T_C \sim 270$ K) in Pr_{0.1}Ce_{0.4}Sr_{0.5}MnO₃ using magnetization and heat capacity measurements. The adiabatic magnetic entropy change $|\Delta S|$ obtained from magnetization and heat capacity measurements for a magnetic field change of 2 T is around 1.3 J/kg K.



Near-complete phase transfer of single-wall carbon nanotubes by covalent functionalization

Bhalchandra Kakade, Sanjay Patil, Bhaskar Sathe, Suresh Gokhale and Vijayamohan Pillai 599–606

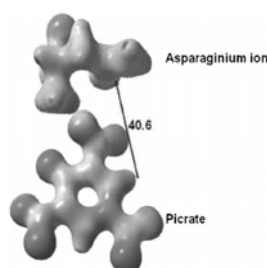
A clean and higher degree of amidation is achieved using oxalyl chloride preceded by microwave treatment in acid mixture. A maximum of 30 wt% of oxygenated groups have been generated on the side walls by rapid microwave treatment, leading to a solubility of 2.6–5 mg/mL in water.



Covalent and non-covalent functionalization and solubilization of double-walled carbon nanotubes in nonpolar and aqueous media

L S Panchakarla and A Govindaraj 607–611

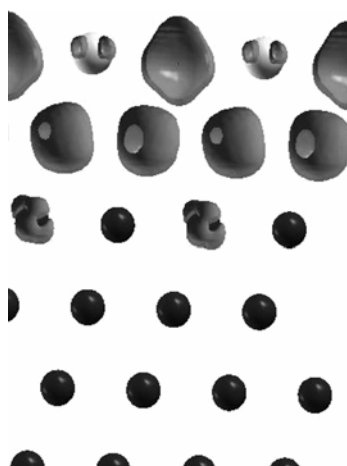
Functionalization of double-walled carbon nanotubes (DWNTs) has been carried out by both covalent and non-covalent means. These samples are soluble in different non-polar and aqueous media.



Charge density analysis of two proton transfer complexes: Understanding hydrogen bonding and determination of in-crystal dipole moments

Reji Thomas, Shrinwantu Pal, Ayan Datta, Mariusz K Marchewka, Henryk Ratajczak, Swapan K Pati and G U Kulkarni 613–620

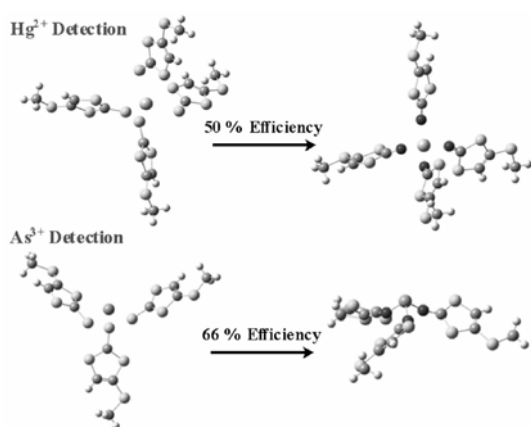
Hydrogen bonding mediated proton transfer in non-centric crystal field give rise to enhancement in asymmetric unit dipole moment.



Competition between elastic and chemical effects in the intermixing of Co and Ag on Rh(111)

Mighfar Imam, Madhura Marathe and Shobhana Narasimhan 621–626

Low dimensionality and reduced coordination can bring about many interesting changes in the structural and magnetic properties of materials. For example, it has been suggested that bulkimmiscible metals may form a strain-stabilized surface alloy when deposited on a substrate of intermediate lattice constant. Co and Ag co-deposited on a Rh(111) substrate constitute such a system, and we have performed *ab initio* density functional theory calculations to study its properties. We find that though elastic effects indeed favour intermixing of Co and Ag in this system, chemical effects oppose this and prevail, so that mixing at the atomic level is ultimately disfavoured.

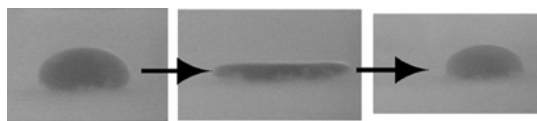


Molecular modelling of a chemodosimeter for the selective detection of As(III) ion in water

Sairam S Mallajosyula, Usha H, Ayan Datta and Swapan K Pati 627–635

We have modelled for the first time a chemodosimeter for As(III) detection in water. The chemodosimeter modelled is a 1,3-dithiole-2-thione derivative with an anthracene unit. Quantum chemical calculations reveal that the dosimeter action is intrinsically dependent on the thiophilic affinity and the coordination sphere of the metal ion. Binding studies for a series of metal ions: Pb(II), Cd(II), Hg(II), Ni(II) and As(III) followed by an analysis of the complete reaction pathway explains the high selectivity of the dosimeter towards As(III). The dosimeter efficiency is calculated as 66% for As(III)-ion.

Surfactant controlled switching of water-in-oil wetting behaviour of porous silica films grown at oil–water interfaces



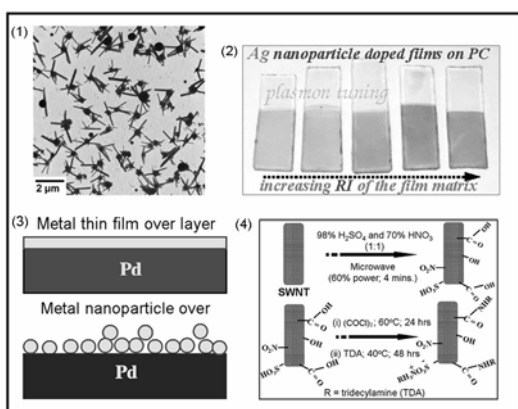
Manish M Kulkarni, Rajdip Bandyopadhyaya and Ashutosh Sharma 637–643

Partially reversible wetting transitions of a water-in-oil droplet on a porous silica film straddling an oil–water interface. The wetting of the film is controlled by changing the aqueous sub-phase surfactant concentration.

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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).