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Agency for Science, Technology and Research SINGAPORE

Symposium P Poster Session

Tue - 2 Jul 13 | 08:30 - 16:30 | Hall 403 @ Level 4

Sn. 1 P-PO1-1

Synthesis and Characterization of Ultrafine TiO2 Nanocrystal Via an Aqueous Sol-gel Process at Room Temperature

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Sn. 2 P-PO1-2

Study on Chemical State and Property Change of the Novel Calcium Phosphate Composite Material Synthesized by Wet Method

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Sn. 3 P-PO1-3

Carbon Doped ZnO Micro Hollow Spheres for Visible Light Responsive Photocatalyst

Taiki IHARA[1+], Hajime WAGATA[2], Toshihiro KOGURE[3], Ken-ichi KATSUMATA[4], Kiyoshi OKADA[4], Nobuhiro MATSUSHITA[4#]

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Sn. 4 P-PO1-4

Supercritical Co2-based Processing of Amorphous Teflon-AF Fluoropolymers: Surfactant-free Dispersions and Superhydrophobic Films for Low-k Applications

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Sn. 5 P-PO1-5

Mesoporous Carbons Functionalization with Horseradish Peroxidase Using Supercritical Carbon Dioxide: Optimization and Comparison with Conventional Approach

Akshay JAIN[1], VERONICA[1+], Rajasekhar BALASUBRAMANIAN[2], Sundaramurthy JAYARAMAN[1], M P SRINIVASAN[1#]

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Sn. 6 P-PO1-6

Sequences-selective Binding of Oligonucleotides to Superparamagnetic Nanoparticles: Fabrication of Functional Bionanostructures

Alexandra PERSHINA[1#+], Anna MAGAEVA[2], Alexey SAZONOV[1]

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Sn. 7 P-PO1-7

Antimicrobial Response of Ag- and Zr-based Thin Film Metallic Glasses

Y. Y. CHU[1+], T. Y. WU[1], Jacob HUANG[2#]

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Sn. 8 P-PO1-8

A Facile Route to Synthesis Hydroxyapatite – Zirconia Nanocomposite and Their Antibacterial Activity

I REETA MARY[1,2+], D MANGALARAJ[1], C VISWANATHAN[1], N PONPANDIAN[1#]

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Sn. 9 P-PO1-9

Phthalocyanine Based Self-assembled Nanowires for Room Temperature ppb Level Cl2 Sensing Application

Rajan SAINI[1#+], Aman MAHAJAN[1], R.K. BEDI[1], D.K. ASWAL[2]

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Sn. 10 P-PO1-10

Study of Optical and Conducting Properties of FeCl3 Doped PVA Polymers

Thejas URS G[1+], Radhika V HURKADLI[2], Niranjana M[2], Basavaraj R VARDIMATH[2], Manjunath A[3], Somashekar R[1#]

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Sn. 11 P-PO1-11

Effect of Purity Enhancement on Surface Modification of Vein Graphite

Gayani AMARAWEERA[1#+], Nanda BALASOORIYA[2], Athula WIJAYASINGHE[1], Nishantha ATTANAYAKE[3], Lakshman DISSANAYAKE[1]

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Sn. 12 P-PO1-12

Polymer Nanofibers Embedded with Eu(3+) Doped ZnO Nanocrystals

Subhash KONDAWAR[1], Priyanka CHOUBEY[1#+], Shikha AGRAWAL[1], Pallavi PATIL[1]

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Sn. 13 P-PO1-13

A Study on the Growth Rates of CdSe and CdTe Quantum Dots in a Simple Colloidal Synthesis

Men Shu TAN[1], Min Joon HUANG[1], Hannah GARDNER[1#+]

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Sn. 14 P-PO1-14

Urease Biosensor Based on Polypyrrole/MWCNT Nanocomposite Films for Detection of Heavy Metal Ions in Water

Bhavna MESHRAM[1#+], Subhash KONDAWAR[1], Ritu MAHORE[1], Ashish MAHAJAN[1]

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Sn. 15 P-PO1-15

Growth Mechanism of Single-crystalline CeO2 Nanocrystals Revealed by Electron Tomography

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Sn. 16 P-PO1-16

Band Structure Modification in Cobalt Doped Diluted Magnetic Semiconductor (DMS) Nanoparticles Synthesised by a Non Alkoxide Base Sol Gel Process

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Effect of Purity Enhancement on Surface Modification of Vein Graphite

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Natural graphite has been identified as a cost effective source to produce anode material in rechargeable batteries, graphene and graphite oxide etc. However, impurities and the surface structure of natural graphite limit their use in above applications. Although Sri Lankan vein graphite is renowned for its high purity and crystallinity further enhancement of purity is necessary before it is used for such advanced applications. Present work investigates the effect of acid leaching on the enhancement of purity and surface modification of Sri Lankan vein graphite. Different morphological types of vein graphite were treated with 5-20 vol. % HCl at 60 -65 ^{0}C for 75 minutes. Graphite with 98.50 to 99.80 % of initial carbon content can be upgraded into 99.5 to 99.99 % of carbon by successful removal of impurities present in sulfide and carbonate forms. Since this method utilizes acids with low concentrations at low temperatures depending on the initial impurity content, it can be considered as relatively cost effective compared to the existing methods.

Surface modification of purified graphite was done by thermal and chemical oxidation. Thermal oxidation was performed at 550 ^{0}C in box furnace under air for 6 hours. For chemical oxidation, graphite was treated with strong oxidative agents, 69% HNO_3, 0.1 M $(NH_4)_2S_2O_8$ and 37% H_2O_2 at 60 ^{0}C for 24 hours. Fourier transform infrared (FTIR) spectra of graphite after thermal and chemical oxidation showed absorption peaks corresponding to $\nu_{C=O}$ stretching around 1740 – 1680 cm^{-1} and ν_{C-O} stretching around 1200 -1000 cm^{-1} regions, indicating surface oxidation. It also indicates that the chemical oxidation effectively oxidized the purified graphite surface compared to thermal oxidation. Therefore we propose that the tested purification method together with chemical oxidation can be used as a cost effective approach to enhance the properties of vein graphite for advanced applications.