



applied surface science

A journal devoted to applied physics
and chemistry of surfaces and interfaces

Editor in Chief:

Henrik Rudolph, Breda, The Netherlands

Editors:

Frederico Rosei, Varennes (QC), Canada

Hikaru Kobayashi, Osaka, Japan

Jingguang Chen, New York, NY, USA

Peter Schaaf, Ilmenau, Germany

Robert L. Opila, Newark, DE, USA

Sefik Suzer, Ankara, Turkey

Tadahiro Komeda, Sendai-Shi, Japan

Thomas K. Lippert, Villigen, Switzerland

Weixin Huang, Hefei, China

Fátima Montemor, Lisboa, Portugal

Peter Kingshott, Hawthorn, Australia

Volume 273, pp. 1–840

15 May 2013

Available online at www.sciencedirect.com

SciVerse ScienceDirect

applied surface science

Contents

Volume 273 (2013)

Regular papers

- Modification of polyimide wetting properties by laser ablated conical microstructures
B.T. Least and D.A. Willis 1
- Studies on the optoelectronic properties of the thermally evaporated tin-doped indium oxide nanostructures
K.-Y. Pan, L.-D. Lin, L.-W. Chang and H.C. Shih 12
- Fabrication of two domain Cu₂O(0 1 1) films on MgO(0 0 1) by pulsed laser deposition
Y. Fu, H. Lei, X. Wang, D. Yan, L. Cao, G. Yao, C. Shen, L. Peng, Y. Zhao, Y. Wang and W. Wu 19
- Co-culture of vascular endothelial cells and smooth muscle cells by hyaluronic acid micro-pattern on titanium surface
J. Li, G. Li, K. Zhang, Y. Liao, P. Yang, M.F. Maitz and N. Huang 24
- Substrate material affects wettability of surfaces coated and sintered with silica nanoparticles
K. Wei, H. Zeng and Y. Zhao 32
- Dependence of precursor composition on patterning and morphology of sol-gel soft lithography based zinc zirconium oxide thin films
S. Bera, M. Pal, S. Sarkar and S. Jana 39
- Electrochemical anodic oxidation of nitrogen doped carbon nanowall films: X-ray photoelectron and Micro-Raman spectroscopy study
A. Achour, S. Vizireanu, G. Dinescu, L. Le Brizoual, M.-A. Djouadi and M. Boujita 49
- Low temperature wet etching to reveal sub-surface damage in sapphire substrates
P. Kumar, J. Lee, G. Lee, S. Rao, D. Singh and R.K. Singh 58
- Microstructure and properties of composite polyetheretherketone/Bioglass® coatings deposited on Ti-6Al-7Nb alloy for medical applications
T. Moskalewicz, S. Seuss and A.R. Boccaccini 62
- Removal of uranium from aqueous solution by a low cost and high-efficient adsorbent
Y.-H. Liu, Y.-Q. Wang, Z.-B. Zhang, X.-H. Cao, W.-B. Nie, Q. Li and R. Hua 68
- Anomalous conformational transitions in cytochrome C adsorbing to Langmuir-Blodgett films
K. Sankaranarayanan, B.U. Nair and A. Dhathathreyan 75
- Synthesis and photocatalytic application of Au/Ag nanoparticle-sensitized ZnO films
L. Chen, T. Tran, T. C. Huang, J. Li, L. Yuan and Q. Cai 82
- Surface-roughness-assisted formation of large-scale vertically aligned CdS nanorod arrays via solvothermal method
M. Zhou, S. Yan, Y. Shi, M. Yang, H. Sun, J. Wang, Y. Yin and F. Gao 89
- Deuterium plasma exposure on rhodium: Reflectivity monitoring and evidence of subsurface deuteride formation
B. Eren, M. Wisse, L. Marot, R. Steiner and E. Meyer 94
- Ultrafast laser parallel microprocessing using high uniformity binary Damman grating generated beam array
Z. Kuang, W. Perrie, D. Liu, S.P. Edwardson, Y. Jiang, E. Fearon, K.G. Watkins and G. Dearden 101
- Metal-assisted homogeneous etching of single crystal silicon: A novel approach to obtain an ultra-thin silicon wafer
F. Bai, M. Li, D. Song, H. Yu, B. Jiang and Y. Li 107
- Theoretical study on electronic structure and optical properties of Ga_{0.75}Al_{0.25}N(0 0 1) surface
Y. Mingzhu, C. Benkang, H. Guanghui, G. Jing, W. Honggang and W. Meishan 111
- Effects of particle size and pH value on the hydrophilicity of graphene oxide
X. Hu, Y. Yu, W. Hou, J. Zhou and L. Song 118
- Study on laser surface remelting of plasma-sprayed Al-Si/1 wt% nano-Si₃N₄ coating on AZ31B magnesium alloy
Y. Ge, W. Wang, X. Wang, Z. Cui and B. Xu 122
- Tensile property of low carbon steel with gridding units
C. Wang, H. Zhou, Z. Zhang, Z. Jing, D. Cong, C. Meng and L. Ren 128
- Processable polyaniline/titania nanocomposites with good photocatalytic and conductivity properties prepared via peroxo-titanium complex catalyzed emulsion polymerization approach
Y. Li, Y. Yu, L. Wu and J. Zhi 135
- Role of the surface polarity in governing the luminescence properties of ZnO nanoparticles synthesized by Sol-gel route
A. Sharma, S. Dhar and B.P. Singh 144
- Photochromism of amorphous molybdenum oxide films with different initial Mo⁵⁺ relative concentrations
M. Rouhani, Y.L. Foo, J. Hobley, J. Pan, G.S. Subramanian, X. Yu, A. Rusydi and S. Gorelik 150
- Synthesis and characterization of AgBr/AgNbO₃ composite with enhanced visible-light photocatalytic activity
C. Wang, J. Yan, X. Wu, Y. Song, G. Cai, H. Xu, J. Zhu and H. Li 159
- The effect of oxidation treatment with supercritical water/hydrogen peroxide system on intersurface performance for polyacrylonitrile-based carbon fibers
L. Meng, D. Fan, C. Zhang, Z. Jiang and Y. Huang 167
- Validity of "sputtering and re-condensation" model in active screen cage plasma nitriding process
A. Saeed, A.W. Khan, F. Jan, M. Abrar, M. Khalid and M. Zakaullah 173
- Fabrication of chitosan-silver nanoparticle hybrid 3D porous structure as a SERS substrate for biomedical applications
G.-B. Jung, J.-H. Kim, J.S. Burm and H.-K. Park 179

(Contents continued on BM I)



(Continued from outside back cover)

Superhydrophobic film fabricated by controlled microphase separation of PEO-PLA mixture and its transparency property P. Pi, W. Mu, G. Fei and Y. Deng	184	A facile method for synthesis of N-doped TiO ₂ nanooctahedra, nanoparticles, and nanospheres and enhanced photocatalytic activity J. Du, G. Zhao, Y. Shi, HaoYang, Y. Li, G. Zhu, Y. Mao, R. Sa and W. Wang	278
Experimental study of corrosion behavior for burnished aluminum alloy by EWF, EBSD, EIS and Raman spectra L. Jinlong, L. Hongyun and X. Jinpeng	192	Surface characteristics of etched parylene-C films for low-damaged patterning process using inductively-coupled O ₂ /CHF ₃ gas plasma Y.-H. Ham, D.A. Shutov and K.-H. Kwon	287
The effect of surface texturing on reducing the friction and wear of steel under lubricated sliding contact W. Tang, Y. Zhou, H. Zhu and H. Yang	199	Divacancy-assisted transition metal adsorption on the BN graphene and its interaction with hydrogen molecules: a theoretical study Y. Chen, H. Wang, H. Wang, J.-x. Zhao, Q.-h. Cai, X.-G. Wang and Y.-h. Ding	293
Synthesis of fluorinated nano-silica and its application in wettability alteration near-wellbore region in gas condensate reservoirs M.A. Mousavi, S. Hassanajili and M.R. Rahimpour	205	Phosphorus-doped graphene and (8, 0) carbon nanotube: Structural, electronic, magnetic properties, and chemical reactivity H.-m. Wang, H.-x. Wang, Y. Chen, Y.-j. Liu, J.-x. Zhao, Q.-h. Cai and X.-z. Wang	302
Effect of wettability on surface morphologies and optical properties of Ag thin films grown on glass and polymer substrates by thermal evaporation J. Lv	215	Titanium bone implants with superimposed micro/nano-scale porosity and antibacterial capability B.S. Necula, I. Apachitei, L.E. Fratila-Apachitei, E.J. van Langelaan and J. Duszczyk	310
Dynamics of porphyrin adsorption on highly oriented pyrolytic graphite monitored by scanning tunnelling microscopy at the liquid/solid interface Q. Ferreira, A.M. Bragança, N.M.M. Moura, M.A.F. Faustino, L. Alcácer and J. Morgado	220	Electron scattering at surfaces and grain boundaries in thin Au films R. Henriquez, M. Flores, L. Moraga, G. Kremer, C. González-Fuentes and R.C. Munoz	315
One-pot synthesis of peacock-shaped TiO ₂ light scattering layer with TiO ₂ nanorods film for dye-sensitized solar cells H.S. Kim, Y.-J. Kim, W. Lee and S.H. Kang	226	Characterization of transparent conductive delafossite-CuCr _{1-x} O ₂ films H.-Y. Chen, K.-P. Chang and C.-C. Yang	324
Photoluminescence and I-V characteristics of the carbonized silicon nanoporous pillar array H. Wang, R. Xue, Z. Li and Y. Wang	233	The structure of Pd-M supported catalysts used in the hydrogen transfer reactions (M = In, Bi and Te) I.A. Witońska, M.J. Walock, P. Dziugan, S. Karski and A.V. Stanishevsky	330
Uniform β-Co(OH) ₂ disc-like nanostructures prepared by low-temperature electrochemical rout as an electrode material for supercapacitors M. Aghazadeh, H.M. Shiri and A.-A.M. Barmi	237	Labile Zn ions on octacalcium phosphate-derived Zn-containing hydroxyapatite surfaces Y. Honda, T. Anada, S. Morimoto and O. Suzuki	343
Microstructure and magnetic properties of L1 ₀ FePt-MgO/Fe-MgO thin films L. Liu, Q. Li, H. Dang, L. Hao, J. Cao, Y. Li, Y. Wang, J. Bai and F. Wei	243	Phosphorus doped TiO ₂ as oxygen sensor with low operating temperature and sensing mechanism Z. Han, J. Wang, L. Liao, H. Pan, S. Shen and J. Chen	349
Reactive growth of MgO overlayers on Fe(0 0 1) surfaces studied by low-energy electron diffraction and atomic force microscopy A. Tekiel, S. Fostner, J. Topple, Y. Miyahara and P. Grütter	247	Structure-activity relationship of CuO/MnO ₂ catalysts in CO oxidation K. Qian, Z. Qian, Q. Hua, Z. Jiang and W. Huang	357
The hydrogen generation from alkaline NaBH ₄ solution by using electroplated amorphous Co-Ni-P film catalysts Y. Guo, Q. Feng and J. Ma	253	Synthesis of nanocrystalline TiC reinforced W nanocomposites by high-energy mechanical alloying: Microstructural evolution and its mechanism G. Zhang and D. Gu	364
Upconversion properties in hexagonal-phase NaYF ₄ :Er ³⁺ /NaYF ₄ nanocrystals by off-resonant excitation X. Luo and K. Akimoto	257	Capacitive humidity-sensing properties of Zn ₂ SiO ₄ film grown on silicon nanoporous pillar array W.C. Wang, Y.T. Tian, K. Li, E.Y. Lu, D.S. Gong and X.J. Li	372
Pt and Pd as catalyst deposited by hydrogen reduction of metal salts on WO ₃ films for gasochromic application N. Tahmasebi Garavand, S.M. Mahdavi and A. Irajizad	261	Marble protection: An inorganic electrokinetic approach P. Meloni, F. Manca and G. Carcangiu	377
Comparative study on catalyst-free formation and electron field emission of carbon nanotips and nanotubes grown by chemical vapor deposition B.B. Wang, K. Zheng and R.W. Shao	268	Imaging the electronic structure of carbon nanotubes decorated with Fe ₂ O ₃ nanoparticles Y. Nie, L. Bai, J. Gao, J. Liu, G. Zhao, T. Xie, X.-H. Sun and J. Zhong	386
Preparation and luminescence properties of Tb ³⁺ doped SiO ₂ film on TiO ₂ nanotube arrays Y. Shang, E. Liu, X. Hu, H. Miao, L. Zhang, S. Zhan, R. Ji, D. Zhang, J. Fan and L. Xu	273	On the growth and photocatalytic activity of the vertically aligned ZnO nanorods grafted by CdS shells M. Zirak, O. Moradlou, M.R. Bayati, Y.T. Nien and A.Z. Moshfegh	391
		Time dependency of the hydrophilicity and hydrophobicity of metallic alloys subjected to femtosecond laser irradiations P. Bizi-bandoki, S. Valette, E. Audouard and S. Benayoun	399

- Structure and tribological properties of MoCN-Ag coatings in the temperature range of 25–700 °C
D.V. Shtansky, A.V. Bondarev, Ph.V. Kiryukhantsev-Korneev, T.C. Rojas, V. Godinho and A. Fernández 408
- Charge transfer and band bending at Au/Pb(Zr_{0.2}Ti_{0.8})O₃ interfaces investigated by photoelectron spectroscopy
N.G. Apostol, L.E. Stoflea, G.A. Lungu, C. Chirila, L. Trupina, R.F. Negrea, C. Ghica, L. Pintilie and C.M. Teodorescu 415
- Fabrication and corrosion resistance of HVOF-sprayed Ni₂Si intermetallic compound
M.M. Verdian, K. Raeissi and M. Salehi 426
- A surface-conducted field emission device with suspended graphene cathodes
C. Wu, F. Li, Y. Zhang and T. Guo 432
- Electronic structure and optical band gap of silver photo-diffused Ge₂Sb₂Te₃ thin film
S. Kumar, D. Singh and R. Thangaraj 437
- Superhydrophilic properties of plasma-treated *Posidonia oceanica*
H.S. Salapare III, Ma. G.J.P. Tiquio and H.J. Ramos 444
- Equilibrium and kinetic studies of C.I. Basic Blue 41 adsorption onto N, F-codoped flower-like TiO₂ microspheres
Y. Jiang, Y. Luo, F. Zhang, L. Guo and L. Ni 448
- Effect of annealing temperature on the microstructural, optical and electrical properties of CeO₂ nanoparticles by chemical precipitation method
R. Suresh, V. Ponnuswamy and R. Mariappan 457
- Investigation of performance degradation in metallized film capacitors
M. Godec, D. Mandrino and M. Gaberšček 465
- Ethylene oxide-*block*-butylene oxide copolymer uptake by silicone hydrogel contact lens materials
Y. Huo, H. Ketelson and S.S. Perry 472
- Ultrasonically sprayed ZnO:Co thin films: Growth and characterization
B. Demirsalcuk and V. Bilgin 478
- Graphene-nickel composites
D. Kuang, L. Xu, L. Liu, W. Hu and Y. Wu 484
- Room-temperature preparation and properties of cadmium sulfide thin films by ion-beam sputtering deposition
G.-X. Liang, P. Fan, Z.-H. Zheng, J.-T. Luo, D.-P. Zhang, C.-M. Chen and P.-J. Cao 491
- Role of the Si-Si bond stability in the first stages of Ti diffusion on a Si(1 1 1) 2 × 1 surface. A periodic DFT study
R. Añez, A. Sierraalta, M.A. San-Miguel and J. Fdez. Sanz 496
- The effects of low power density CO₂ laser irradiation on graphene properties
T. Huang, J. Long, M. Zhong, J. Jiang, X. Ye, Z. Lin and L. Li 502
- Comparison between FTIR and XPS characterization of amino acid glycine adsorption onto diamond-like carbon (DLC) and silicon doped DLC
M.H. Ahmed, J.A. Byrne, J.A.D. McLaughlin, A. Elhissi and W. Ahmed 507
- Catalyst-assisted vertical growth of carbon nanotubes on Inconel coated commercial copper foil substrates versus sputtered copper films
G. Atthipalli, H. Wang and J.L. Gray 515
- Grain and grain boundary characters in surface layer of untreated and plasma nitrocarburized 18Ni maraging steel with nanocrystalline structure
M.F. Yan, Y.Q. Wu and R.L. Liu 520
- Study of Pt-Rh/CeO₂-ZrO₂-M_xO_y (M = Y, La)/Al₂O₃ three-way catalysts
G. Jiaxiu, S. Zhonghua, W. Dongdong, Y. Huaqiang, G. Maochu and C. Yaoqiang 527
- Influence of roughness on surface instability of medical grade cobalt-chromium alloy (CoCrMo) during contact corrosion-fatigue
J.J. Ryu and P. Shrotriya 536
- Selective sensing of copper and mercury ions with pyrene-functionalized fluorescent film sensor containing a hydrophilic spacer
Y. Cao, L. Ding, W. Hu, L. Wang and Y. Fang 542
- Towards understanding hydrophobic recovery of plasma treated polymers: Storing in high polarity liquids suppresses hydrophobic recovery
E. Bormashenko, G. Chaniel and R. Gryniov 549
- Properties of ultrathin Pb layers on the Ni₃Al(1 1 1) face
K. Miśków and A. Krupski 554
- Functionalization of PDMS modified and plasma activated two-component polyurethane coatings by surface attachment of enzymes
A. Kreider, K. Richter, S. Sell, M. Fenske, C. Tornow, V. Stenzel and I. Grunwald 562
- Tribological and stability investigations of alkylphosphonic acids on alumina surface
M. Cichomski, K. Kośla, J. Grobelny, W. Kozłowski and W. Szmaja 570
- Surface interactions, corrosion processes and lubricating performance of protic and aprotic ionic liquids with OFHC copper
T. Espinosa, J. Sanes, A.-E. Jiménez and M.-D. Bermúdez 578
- The inter-metallic oxide of ZnO/ITO/ZnO tri-layer films using a heat-induced diffusion mechanism
K.-J. Chen, F.-Y. Hung, T.-S. Lui, S.-P. Chang and W.-L. Wang 598
- Effect of the cathodic polarization on structural and morphological properties of FTO and ITO thin films
C.C.P. Cid, E.R. Spada and M.L. Sartorelli 603
- Sensitivity of photoelectron energy loss spectroscopy to surface reconstruction of microcrystalline diamond films
D.G.F. David, M.-A. Pinault-Thaury, D. Ballutaud and C. Godet 607
- Cu₂ZnSnSe₄ thin films prepared by selenization of one-step electrochemically deposited Cu-Zn-Sn-Se precursors
M. Meng, L. Wan, P. Zou, S. Miao and J. Xu 613
- A hybrid approach to determine critical and erosion velocities in the cold spray process
A. Moridi, S.M. Hassani-Gangaraj and M. Guagliano 617
- Characterization of nanoscale clusters fabricated by pulsed laser irradiation of thin Au films
Y. Fang, Y. Hou, F. Teng, Z. Lou, A. Tang, B. Zhang, L. Meng, Y. Ning and L. Lu 625
- FTIR-ATR spectroscopy in thin film studies: The importance of sampling depth and deposition substrate
G. Laroche, J. Fitremann and N. Gherardi 632
- Enhanced photocatalytic activity of titania with unique surface indium and boron species
Y. Yu, E. Wang, J. Yuan and Y. Cao 638
- Magnetic properties and microstructure of Tb_xDy_{1-x}Fe₂ thin films sputtered on Pt/TiO₂/SiO₂/Si substrate
J. Zhu, C. Cibert, B. Domenges, R. Bouregba and G. Poullain 645
- A facile fabrication of light diffusing film with LDP/polyacrylates composites coating for anti-glare LED application
S. Song, Y. Sun, Y. Lin and B. You 652

CdS nanocrystals/TiO ₂ /crosslinked chitosan composite: Facile preparation, characterization and adsorption-photocatalytic properties H. Zhu, R. Jiang, L. Xiao, L. Liu, C. Cao and G. Zeng	661	Synthesis of silver-incorporated hydroxyapatite nanocomposites for antimicrobial implant coatings X. Liu, Y. Mou, S. Wu and H.C. Man	748
Structural properties and growth evolution of diamond-like carbon films with different incident energies: A molecular dynamics study X. Li, P. Ke, H. Zheng and A. Wang	670	A synergistic combination of tetraethylorthosilicate and multiphosphonic acid offers excellent corrosion protection to AA1100 aluminum alloy V. Dalmoro, J.H.Z. dos Santos, E. Armelin, C. Alemán and D.S. Azambuja	758
Titania-supported silver nanoparticles: An efficient and reusable catalyst for reduction of 4-nitrophenol S.P. Deshmukh, R.K. Dhokale, H.M. Yadav, S.N. Achary and S.D. Delekar	676	Preparation and characterization of PVA-I complex doped mesoporous TiO ₂ by hydrothermal method Q. Shi, C. Jiang, Y. Wang, W. Yang and C. Yang	769
Magnetic composite ZnFe ₂ O ₄ /SrFe ₁₂ O ₁₉ : Preparation, characterization, and photocatalytic activity under visible light T. Xie, L. Xu, C. Liu and Y. Wang	684	Highly transparent and thermally stable superhydrophobic coatings from the deposition of silica aerogels J. Lin, H. Chen, T. Fei, C. Liu and J. Zhang	776
Super-mercuryphobic and hydrophobic diamond surfaces with hierarchical structures: Vanishment of the contact angle hysteresis with mercury J.V. Escobar, C. Garza, J.C. Alonso and R. Castillo	692	Active screen plasma nitriding enhances cell attachment to polymer surfaces G. Kaklamani, J. Bowen, N. Mehrban, H. Dong, L.M. Grover and A. Stamboulis	787
Crystallization behaviors and electric properties of (Pb _{0.8} Ca _{0.2})TiO ₃ thin films prepared by a sol-gel route Q.G. Chi, H.F. Zhu, J.Q. Lin, C.T. Chen, X. Wang, Y. Chen and Q.Q. Lei	702	Comparative investigation on HVOF sprayed carbide-based coatings M. Xie, S. Zhang and M. Li	799
Synthesis, characterization, and mercury adsorption properties of hybrid mesoporous aluminosilicate sieve prepared with fly ash M. Liu, L.-a. Hou, B. Xi, Y. Zhao and X. Xia	706	Realizing a variety of carbon nanostructures at low temperature using MW-PECVD of (CH ₄ + H ₂) plasma A. Banerjee and D. Das	806
Thermoplastic polymers surfaces for Dip-Pen Nanolithography of oligonucleotides R. Suriano, S. Biella, F. Cesura, M. Levi and S. Turri	717	Nanoindentation behaviors of amorphous carbon films containing nanocrystalline graphite and diamond clusters prepared by radio frequency sputtering X. Fan, K. Nose, D. Diao and T. Yoshida	816
Effect of [Al] and [In] molar ratio in solutions on the growth and microstructure of electrodeposition Cu(In,Al)Se ₂ films K.-C. Huang, C.-L. Liu, P.-K. Hung and M.-P. Houn	723	Preparation and characterization of ZnO-deposited DBD plasma-treated PP packaging film with antibacterial activities S. Paisonin, O. Pornsunthorntawee and R. Rujiravanit	824
Regular growth combined with lateral etching in diamond deposited over silicon substrate by using hot filament chemical vapor deposition technique M. Ali and M. Ürgen	730	Correspondence Formation of complex bis(β-mercaptobenzothiazole)-zinc(II) films by pulsed laser deposition K. Zhang, M.A. Yarmolenko, A.A. Rogachev, B. Zhou, X. Jiang, R. Shen and X. Liu	836
Impact of proton diffusion and the hydrogen photospillover upon the photochromic sensitivity of the WO ₃ films and the WO ₃ double-layer structures A.I. Gavriljuk	735		