

**Bhabha Atomic Research Centre
Radiation & Photochemistry Division**

PUBLICATIONS 2007

Journals (Published)

- 1 Efficient Fluorescence Enhancement and Cooperative Binding of an Organic Dye in a Supra-Biomolecular Host-Protein Assembly.
A. C. Bhasikuttan, J. Mohanty, W. M. Nau, H. Pal
Angew. Chem. Int. Ed. 46 (2007) 4120-4122.
- 2 Interaction of Malachite Green with Guanine-Rich Single Strand DNA: Preferential Binding to G-Quadruplex.
A. C. Bhasikuttan, J. Mohanty and H. Pal,
Angew. Chem. Int. Ed. 46 (2007) 9305 –9307.
- 3 New insights into the mechanism of triplet radical-pair combinations. The persistent radical effect masks the distinction between in-cage and out-of-cage processes.
C. A. Chesta, J. Mohanty, W. M. Nau, U. Bhattacharjee, R. G. Weiss,
J. Am. Chem. Soc., 129 (2007) 5012-5022.
- 4 Influence of Electrolytes on the Microenvironment of F127 Triblock Copolymer Micelles: A Solvation and Rotational Dynamics Study of Coumarin Dyes.
Manoj Kumbhakar and Rajib Ganguly
J. Phys. Chem. B, 111 (2007) 3935-3942.
- 5 Rotational Diffusion of Organic Solutes in Surfactant-Block Copolymer Micelles: Role of Electrostatic Interactions and Micellar Hydration
K. S. Mali, G. B Dutt, and T. Mukherjee
J. Phys. Chem. B. 111 (2007) 5878-5884.
- 6 Role of Diffusion and Activation Barrier on the Appearance of Marcus Inversion Behavior: Study of Photoinduced Electron Transfer Reaction in Aqueous Triblock Copolymer (P123) Micellar Solutions.
A. K. Satpati, M. Kumbhakar, S. Nath and H. Pal
J. Phys. Chem. B. 111 (2007) 7550-7560.
- 7 Compartmentalization of reactants in different regions of AOT/heptane/water reverse micelles and its influence on bimolecular electron transfer kinetics.
S. Dutta Choudhury, M. Kumbhakar, S. Nath, S. K. Sarkar, T. Mukherjee and H. Pal
J. Phys. Chem. B. 111 (2007) 8842-8853.
- 8 Physicochemical and photophysical studies on porphyrin-based donor-acceptor systems: Effect of redox potentials on ultrafast electron-transfer dynamics
D. Amilan Jose, A.D. Shukla, G. Ramakrishna, D.K. Palit, H.N. Ghosh and Amitava Das
J. Phys. Chem. B 111 (2007) 9078-9087.
- 9 Effect of ionic surfactants on the hydration behavior of triblock copolymer micelles: A solvation dynamics study of coumarin 153
M. Kumbhakar
J. Phys. Chem. B. 111 (2007) 12154-12161.
- 10 Aggregation of ionic surfactants to block copolymer assemblies: A simple fluorescence spectral study.
M. Kumbhakar
J. Phys. Chem. B. 111 (2007) 14250-14255.

- 11 Structural investigation of asymmetrical dimer radical cation system $(\text{H}_2\text{O}-\text{H}_2\text{S})^+$: Proton-transferred or hemi-bonded?
Ravi Joshi, Tapan Ghanty, S. Naumov and Tulsi Mukherjee.
J. Phys. Chem. A 111 (2007) 2362-2367.
- 12 Charge-Transfer-Induced Twisting of the Nitro Group
Johur. A. Mondal, Moloy Sarkar, Anunay Samanta, Hirendra. N. Ghosh and Dipak K. Palit
J. Phys. Chem. A. 111 (2007) 6122-6126
- 13 Crossed-Beams and Theoretical Studies of the $\text{O}(\text{}^3\text{P}) + \text{H}_2\text{O} \rightarrow \text{HO}_2 + \text{H}$ Reaction Excitation Function
Amy L. Brunsvold, Jianming Zhang, Hari P. Upadhyaya, Timothy K. Minton
Jon P. Camden, Jeffrey T. Paci, and George C. Schatz
J. Phys. Chem. A, 111 (2007) 10907-10913
- 14 Addition-elimination in the reaction of α -hydroxyalkyl radicals with 3,5-pyridinedicarboxylic acid and nicotinic acid: Example of inner sphere organic electron transfer
S.B. Dhiman and D.B. Naik
J. Phys. Chem. A 111 (2007) 11493-11499.
- 15 Ionized state of hydroperoxy radical–water hydrogen bonded complex: $(\text{HO}_2-\text{H}_2\text{O})^+$
Ravi Joshi, Tapan K. Ghanty, Sergej Naumov, and Tulsi Mukherjee
J. Phys. Chem. A 111 (2007) 13590-13594
- 16 Comparative study of ionization of benzidine and its derivatives by free electron transfer and one-electron oxidation
Jasmine A. Jacob, Sergej Naumov, Nandita Biswas, Tulsi Mukherjee and Sudhir Kapoor
J. Phys. Chem. C 111 (2007) 18397-18404.
- 17 Rotational diffusion of an ionic solute in polymorphic environments of a block copolymer: Influence of interfacial friction on solute rotation.
K. S. Mali, G. B. Dutt, and T. Mukherjee
Langmuir 23 (2007) 1041-1046.
- 18 Phenol- and catechol-based ruthenium(II) polypyridyl complexes as colorimetric sensors for fluoride ions
D. A. Jose, Prasenjit Kar, Debasis Koley, Bishwajit Ganguly, Walter Thiel, H.N. Ghosh and Amitava Das
Inorg. Chem. 46 (2007) 5576-5584
- 19 Structure, energy and IR spectra of $\text{I}_2^{\bullet-} \cdot n\text{H}_2\text{O}$ clusters ($n=1-8$): A theoretical study
A. K. Pathak, T. Mukherjee and D. K. Maity
J. Chem. Phys. 126 (2007) 034301.
- 20 Structure of spherical electric double layers: A density functional approach.
T. Goel and C. N. Patra
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- 21 Theoretical studies on photoelectron and IR spectral properties of $\text{Br}_2^{\bullet-} \cdot n\text{H}_2\text{O}$ clusters
A. K. Pathak, T. Mukherjee and D. K. Maity
J. Chem. Phys. 127 (2007) 044304.
- 22 Simultaneous time and frequency detection in femtosecond coherent Raman spectroscopy II. Application to acetonitrile.
S. Nath, D. C. Urbanek, S. J. Kern, M. A. Berg
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- 23 Rotational Diffusion of Ionic and Neutral Solutes in Surfactant-Block Copolymer Aggregates: Effect of surfactant to block copolymer mole ratio on solute rotation
K. S. Mali, G. B Dutt, and T. Mukherjee
J. Chem. Phys. 127 (2007) 154904.
- 24 Photoinduced bimolecular electron transfer kinetics in small unilamellar vesicles.
S. Dutta Choudhury, M. Kumbhakar, S. Nath and H. Pal
J. Chem. Phys. 127 (2007) 194901.
- 25 Electrodeposition of silver nanodendrites
K.Sreejith*, J Nuwad, C Thinaharan, G.K. Dey and C G S Pillai
Nanotechnology 18 (2007) 125610
- 26 Acid-induced synthesis of polyvinyl alcohol-stabilized selenium nanoparticles.
Chetan Shah, Manmohan Kumar and P. N. Bajaj
Nanotechnology 18 (2007) 385607.
- 27 New ICT probes: Synthesis and photophysical studies of N-phenyl aza-15-crown-5 aryl/heteroaryl oxadiazoles under acidic condition and in the presence of selected metal ions.
S. H. Mashraqui, S. Sundaram and A. C. Bhasikuttan
Tetrahedron 63 (2007) 1680-1688.
- 28 Zn²⁺ selective luminescent “off-on” probes derived from diaryl oxadiazole and aza-15-crown-5.
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Tetrahedron, 63 (2007) 11093-11100.
- 29 Role of positional isomers on receptor-anion binding and evidence for resonance energy transfer
D.A. Jose, D. Krishna Kumar, Prasenjit Kar, S. Verma, Amrita Ghosh, Biswajit Ganguly, H.N. Ghosh and Amitava Das
Tetrahedron 63 (2007) 12007-12014
- 30 Interaction of curcumin with human serum albumin: Thermodynamic properties, Fluorescence energy transfer and Denaturation effects
A. Barik, B. Mishra, A. Kunwar, K. I. Priyadarsini
Chem.Phys.Lett. 436 (2007) 239-243.
- 31 Dissociation dynamics of chloromethyltrimethylsilane at 193 nm
Suresh Dhanya, Awadhesh Kumar, and Prakash D. Naik
Chem. Phys. Lett. 438 (2007) 8-13.
- 32 Adsorption of CGA on colloidal silver particles: DFT and SERS study
Nandita Biswas, Sudhir Kapoor, Harbir S. Mahal and Tulsi Mukherjee
Chem. Phys. Lett. 444 (2007) 338-345.
- 33 Dynamics of 3-mercaptopropionic acid dissociation at 193 nm: OH detection by laser-induced fluorescence
K.K. Pushpa, Hari P. Upadhyaya, Awadhesh Kumar, P.D. Naik and P.N. Bajaj
Chem. Phys. Lett. 445 (2007) 140-146.
- 34 Vibrational Dynamics of the CO Stretching of Fluorenone in Various Alcohols.
S. Hirai, M. Banno, K. Ohta, D. K. Palit and K. Tominaga,
Chem. Phys. Lett. 450 (2007) 44 – 48.
- 35 Supramolecular Dye Laser with Cucurbit[7]uril in Water.
J. Mohanty, H. Pal, A. K. Ray, S. Kumar, W. M. Nau
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- 36 Ultrafast relaxation and coherent oscillations in aminobenzonitriles in the gas phase probed by intense-field ionization
Werner Fuß, Wolfram E. Schmid, Kumbil Kuttan Pushpa, Sergei A. Trushin, Tomoyuki Yatsuhashi
Phys. Chem. Chem. Phys. 9 (2007) 1151-1169.
- 37 A concise review of dynamical processes in polymorphic environments of a block copolymer: Rotational diffusion and photoisomerization.
K. S. Mali and G. B. Dutt
J. Chem. Sci. 119 (2007) 147-159.
- 38 Effect of strong coupling on interfacial electron transfer dynamics in dye-sensitized TiO₂ semiconductor nanoparticles
H.N. Ghosh
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- 39 Laser-induced fluorescence study of the hydrogen atom formation dynamics in the 248 nm gas-phase photodissociation of vibrational state selected water (H₂O (|04⁻))
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- 40 Nitrite formation in aerated aqueous azide solutions: a radiation chemical study,
G.R. Dey,
Res. Chem. Intermed., 33 (2007) 599-611.
- 41 Formation of different products during photo-catalytic reaction on TiO₂ Suspension in water with and without 2-propanol under diverse ambient conditions.
G.R. Dey and K.K. Pushpa,
Res. Chem. Intermed, 33 (2007) 631-644.
- 42 The reduction process of phytic acid - silver ion system: A Pulse Radiolysis Study.
Ravi Joshi and Tulsi Mukherjee.
Radiat. Phys. Chem. 76 (2007) 811-817.
- 43 Effect of curcumin and curcumin copper complex (1:1) on radiation induced changes of anti-oxidant enzymes levels in the livers of Swiss albino mice
K. R. Prabhakar, V. P. Veerapur, A. Kunwar, B. Mishra, A. Barik, K. I. Priyadarsini, M. K. Unnikrishnan.
J. Radiat. Res. 48(3) (2007) 241-245.
- 44 Ascorbic acid monoglucoside as antioxidant and radioprotector
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- 45 Redox reactions of arterenol transients in aqueous solutions,
A. Barik, D. K. Maity, and H. Mohan,
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- 46 Radiolytic product yields in aqueous azide solutions,
G.R. Dey,
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- 47 Anti-cancer activity of vitamin D: Immuno-modulatory and anti-proliferative mechanism
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- 48 Photophysical properties of 1-N-methylamino- and 1-N,N-dimethylamino- 9,10-anthraquinone dyes: a comparison with 1-amino-9,10-anthraquinone dye.
P. Dahiya, D. K. Maity, S. K. Nayak, T. Mukherjee and H. Pal
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- 49 In vitro studies on antiradical and antioxidant activities of fenugreek (*Trigonella foenum graceum*) seeds.
S. Kaviarasan, G. H. Naik, R. Gangabagirathi, C. V. Anuradha, K. I. Priyadarsini
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- 50 Antioxidant activity of some phenolic constituents from green pepper (*Piper nigrum* L.) and fresh nutmeg mace (*Myristica fragrans*)
S. Chatterjee, N. Zareena, S. Gautam, S. Adhikari, S. V. Prasad and A. Sharma
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- 51 In vitro studies on the binding, antioxidant, and cytotoxic actions of punicalagin
A. P. Kulkarni, H. S. Mahal, S. Kapoor and S. M. Aradhya
J. Agric. Food Chem. 55 (2007) 1491-1500.
- 52 Triplet state and phenoxyl radical formation of 3, 4-methylenedioxy phenol: A combined laser flash photolysis and pulse radiolysis study.
Ravi Joshi, S. Kapoor and T. Mukherjee.
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- 53 Novel fluorinophores incorporating diaryl-1,3,4-oxadiazole and aza-crown ring. Potentially sensitive Mg^{2+} ion sensor.
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- 54 Structure, energy and IR spectra of $K-nNH_3$ cluster: A theoretical study
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- 55 Comparative study of copper(II)-curcumin complexes as superoxide dismutase mimics and free radical scavengers
Atanu Barik, B. Mishra, Amit Kunwar, R. M. Kadam, L. Shen, S. Dutta, A. Satpati, S. B. Padhye, Hong-Yu Zhang, K. I. Priyadarsini
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- 56 Anticlastogenic activity of morin against whole body gamma irradiation in Swiss Albino mice
V. K. Parihar, K. R. Prabhakar, V. P. Veerapur, K. I. Priyadarsini, M. K. Unnikrishnan, C. M. Rao
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- 57 Antioxidant and radioprotective effect of the active fraction of *Pilea microphylla* (L) ethanolic extract
K. R. Prabhakar, V. P. Veerapur, P. Bansal, V. Kumar, K. M. Reddy, K. M. Bhagat, K. I. Priyadarsini, M. K. Unnikrishnan
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- 58 Free radical scavenging reactions and antioxidant activity of embelin: and biochemical Pulse radiolytic studies.
Ravi Joshi, J. P. Kamat and T. Mukherjee.
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- 59 Physico-chemical studies on the evaluation of antioxidant activity of herbal extracts and active principles of some Indian medicinal plants
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- 61 Chemical reduction of CO₂ to different products during photo-catalytic reaction on TiO₂ under diverse conditions: An overview,
G.R. Dey,
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- 62 3,3'-Diselenodipropionic acid, an efficient peroxy radical scavenger and a GPx mimic, protects erythrocytes (RBCs) from AAPH induced hemolysis
A. Kunwar, B. Mishra, A. Barik, L. B. Kumbhare, V. K. Jain, K. I. Priyadarsini
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- 63 Studies on β -cyclodextrin Inclusion complex of curcumin
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- 65 DNA protective properties of vanillin against γ -radiation under different conditions; possible mechanisms
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- 66 Ag nanoparticle mediated growth of CdS nanobelts
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- 67 Size tunable synthesis of silver nanoparticles in water-ethylene glycol mixtures
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- 68 Filling and coating of multiwalled carbon nanotubes with silver by DC electrophoresis
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- 69 Synthesis of carbon nanotubes by catalytic vapor decomposition (CVD) method: Optimization of various parameters for the maximum yield
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- 70 Dissolved oxygen removal from primary heat transport systems of Indian PHWRs under nitrogen atmosphere
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- 71 Well-Resolved Coherent Raman Spectra from Femtosecond Pulses
S. Nath, D. C. Urbanek, S. J. Kern and M. A. Berg,
In Ultrafast Phenomena XV, Springer Series in Chemical Physics, edited by P. Corkum, D.Jonas, R. D. Miller and A. M. Weiner Springer-Verlag, Berlin, 88 (2007) 386-388.

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- 73 Hydration of uranyl cations: Effective fragment potential approach
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- 75 Role of ion exchange in permeation process
Jayshree Ramkumar and T. Mukherjee
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- 76 Dielectric Barrier Discharge Initiated Gas-phase Decomposition of CO₂ to CO and C₆-C₉ Alkanes to C₁ to C₃ Hydrocarbons on Glass, Molecular Sieve 10X and TiO₂/ZnO Surfaces.
G.R. Dey, B.N. Singh, Sangita D. Kumar and T.N. Das,
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Books

- 1 Laser induced fluorescence spectroscopy,
P.D. Naik, Awadhesh Kumar, H.P. Upadhyaya, P.N. Bajaj, S.K. Sarkar
Book chapter in Lasers in Chemistry, Ed. Maximilian Lackner,
Wiley-VCH Publications.
- 2 Laser enrichment of isotopes
V. Parthasarathy, P.N. Bajaj, S. K. Sarkar
Book chapter in Lasers in Chemistry, Ed. Maximilian Lackner,
Wiley-VCH Publications.

Journals (accepted)

- 1 Femtosecond transient absorption studies in Cadmium Selenide nanocrystal thin films prepared by chemical bath deposition method
M. C. Rath, J. A. Mondal, D. K. Palit, T. Mukherjee and H. N. Ghosh
J. Nanomaterials
- 2 Solvent polarity induced structural changes in 2,6-diamino-9,10-anthraquinone dye.
P. Dahiya, S. Dutta Choudhury, D. K. Maity, T. Mukherjee and H. Pal
Spectrochimica Acta, Part A.
- 3 Bimolecular electron transfer reactions in coumarin-amine systems: donor-acceptor orientational effect on diffusion-controlled reaction rates.
A. Satpati, S. Nath, M. Kumbhakar, D. K. Maity, S. Senthilkumar and H. Pal
J. Mol. Struct.
- 4 Collective proton motion in the intramolecular hydrogen bonding network and the consequent enhancement in the acidity of hydroxycalixarenes.
M. Shaikh, J. Mohanty, D. K. Maity, S. K. Nayak and H. Pal
J. Photochem. Photobiol. A: Chem

- 5 A novel two-stage process for laser enrichment of sulphur isotopes
P. Mathi, P.K. Sahoo, D.N. Joshi, M.N. Deo, A.K. Nayak, S.K. Sarkar, V. Parthasarathy
J. Photochem. Photobiol. A: Chem.
- 6 Complexation of acridine orange by cucurbit[7]uril and β -cyclodextrin: photophysical effects and pK_a shifts.
S. Mhejabeen, J. Mohanty, P. K. Singh, W. M. Nau and H. Pal
Photochem. Photobiol. Sci.
- 7 Rotational diffusion of a nonpolar and a dipolar solute in 1-butyl-3methylimidazolium hexafluoro phosphate and glycerol: Interplay of size effect and specific interactions.
K.S. Mali, G.B. Dutt and T. Mukherjee
J. Chem. Phys.
- 8 Studies on photodissociation dynamics of butadiene monoxide at 193 nm
Sumana SenGupta, Yogesh Indulkar, Awadhesh Kumar, P.D. Naik, P.N. Bajaj
J. Chem. Phys.
- 9 Photodissociation dynamics of nitrotoluene at 193 and 248 nm: Direct observation of OH formation
Sumana SenGupta, H.P. Upadhyaya, Awadhesh Kumar, S. Dhanya, P.D. Naik, P.N. Bajaj
Chem. Phys. Lett.
- 10 Protection of polymer from atomic-oxygen erosion using Al_2O_3 atomic layer deposition coatings
Russell Cooper, Hari P. Upadhyaya, Timothy K. Minton, Michael R. Berman, Xiaohua Du, Steven M. George
Thin Solid Films.
- 11 Reactions of reducing radicals with 2- and 3- nitroanilines in aqueous solutions: A pulse radiolysis study
Puspalata Rajesh, G.R. Dey, D. B. Naik and K. Kishore
Res. Chem. Intermed.
- 12 Generation and characterization of silver nanoparticles in condensed media: An Overview,
G. R. Dey and T. N. Das
The annual reviews of Plasmonics
- 13 IR Spectra of Small Carbonate-Water Clusters, $CO_3^{2-}(H_2O)_n$: A Theoretical Study
A. K. Pathak, T. Mukherjee and D. K. Maity
Syn. React. Inorg. MetOrg. Nano Met. Chem.
- 14 A theoretical study on $SCN^- + XH$ reactions ($X=O, S$): Hemi bonded vs H-bonded intermediates
A. K. Pathak, T. Mukherjee, and D. K. Maity
J. Mol. Str.THEOCHEM
- 15 A microhydration study of X_2 -water clusters ($X=Cl, Br$ and I): A theoretical study on $X_2 \cdot nH_2O$ clusters ($n=1-8$)
A. K. Pathak, T. Mukherjee, and D. K. Maity
J. Phys. Chem. A
- 16 PVP-stabilized copper nanoparticles: A reusable catalyst for 'click' reaction between terminal alkynes and azides in non-aqueous solvents
Anjana Sarkar, Tulsi Mukherjee and Sudhir Kapoor
J. Phys. Chem. C

- 17 Effect of ligand on the redox reactions of thallium metal clusters
Anjana Sarkar, Tulsī Mukherjee and Sudhir Kapoor
Res. Chem. Interm.
- 18 Effective chemical route for the synthesis of Silver Nanostructures in Formamide
A. Sarkar, S. Kapoor and T. Mukherjee
Res. Chem. Interm.
- 19 Role of phenol derivatives in the formation of silver nanoparticles
Jasmine A. Jacob, Harbir S. Mahal, Nandita Biswas, Tulsī Mukherjee and Sudhir Kapoor
Langmuir
- 20 Tuning of the electrical parameters of a twisted-nematic display material by using electron beam irradiation
R. Dhar, Rohit Verma, M. C. Rath, S. K. Sarkar, V. K. Wadhawan, R. Dabrowski and M. Tykarska
Appl. Phys. Lett.
- 21 A simple one step method for the synthesis of hexagonal Cd_{1-x}Zn_xS (x=0-0.75)
K. Sreejith, K.S. Mali, C.G.S. Pillai
Materials Letters
- 22 Pulse and γ - radiolysis studies on aqueous solution of 1,1'-Dimethyl-2-selenourea.
B. Mishra, Santhosh Kumar, K. I. Priyadarsini
Radiat. Phys. Chem.
- 23 Photodetachment and UV-Vis spectral properties of Cl₂^{•-}.nH₂O clusters: Extrapolation to bulk
A.K. Pathak, T. Mukherjee and D.K. Maity
Chemical Physics Letters
- 24 Correlating the GPx activity of selenocystine derivatives with one-electron redox reactions
B. Mishra, A. Barik, A. Kunwar, L. B. Kumbhare, K. I. Priyadarsini, V. K. Jain.
Phosphorous, Sulphur, Silicon and Related elements
- 25 Detection of shallow electron traps in quantum sized CdS particles using dithiolenes
J. A. Jacob, N. Biswas, T. Mukherjee and S. Kapoor
Res. Chem. Inter.
- 27 Pulse Radiolysis studies on reactions of hydroxyl radicals with selenocystine derivatives
B. Mishra, L. B. Kumbhare, V. K. Jain, K. I. Priyadarsini
J. Phys. Chem. B
- 28 Quantitative cellular uptake, localization and cytotoxicity of curcumin in normal and tumor cells
A. Kunwar, A. Barik, B. Mishra, K. Rathinasamy, R. Pandey, K. I. Priyadarsini
Biochim. Biophys. Acta.
- 29 Radical cations of some water-soluble organoselenium compounds: Insights from Pulse Radiolysis Studies.
K. Indira Priyadarsini and B. Mishra
Radiation Physics & Chemistry (special issue).
- 30 Relaxation Dynamics of the excited states of a ketocyanine dye probed by femtosecond transient absorption Spectroscopy.
J. A. Mondal, S. Verma, H. N. Ghosh and D. K. Palit
J. Chem. Sci.

Journals (communicated)

- 1 Aggregation of sodium dodecyl sulfate to (Ethylene oxide)₂₀-(Propylene oxide)₇₀-(Ethylene oxide)₂₀ Micelles: A steady-state and time resolved fluorescence study of coumarin-153
Manoj Kumbhakar
Chem. Phys. Letter
- 2 Anti-cancer activity of vitamin D: Immuno-modulatory and anti-proliferative mechanism
Ravi Joshi
Ind. J. Radiat. Res.
- 3 Binding studies of curcumin to PVA/PVA-hydrogel and its delivery to liposomes.
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