



Dr. Shiv Prakash Singh

Scientist

Center for Ceramic Processing, International Advanced Research Center for Powder Metallurgy & New Materials (ARCI), Balapur P.O., Hyderabad - 500005, India

Research Interest:

Oxides, Non-Oxide and Metallic Glasses; Glass Powder and Paste; Glass Ceramics; Deformation behavior in Glass; Nanoscience and Nanotechnology

Educational Qualifications:

Doctor of Philosophy (Ph.D.), Jadavpur University, Kolkata, India,

Master of Science (M. Sc.), North Orissa University, Baripada, Odisha, India; Subject: Advanced Physical Chemistry

Research Experience:

2019-Present: Scientist at Center for Ceramic Processing, International Advanced Research Center for Powder Metallurgy & New Materials (ARCI), Hyderabad, India

2016-2019: Scientist at Institute of Nanotechnology, Karlsruhe Institute of Technology, Karlsruhe, Germany

2014-2016: Postdoctoral Research Fellow (FAPESP) at LaMaV, Materials engineering department, Federal University of Sao Carlos, SP-Sao Carlos, Brazil

2013-2013: Research Associate at Indian Institute of Science Education and Research (IISER), Kolkata, India

2007-2013: Research Fellow at CSIR-Central Glass and Ceramic Research Institute, Kolkata, India

Awards:

2017: Guest Scientist Fellowship by Karlsruhe Institute of Technology, Karlsruhe, Germany

2014: FAPESP postdoctoral Fellowship from Research Foundation of State of Sao Paulo, Brazil

2010: Senior Research Fellowship, Council for Scientific and Industrial Research (CSIR), Govt. of India

2011: Best poster award: “International Conference on Specialty Glass & Optical Fiber: Materials, Technology & Devices (ICGF-2011)” held at Central Glass and Ceramics Research Institute, Kolkata

Membership in Scientific Societies:

The American Ceramic Society, The Materials Research Society of India, Chemical Research Society of India, The Indian Physical Society, The Indian Science Congress Association, The Indian Ceramic Society.

Publications

Publications in Refereed Journals:

26. **S. P. Singh**, M. R. Chellali, L. Velasco, Y. Ivanisenko, E. Boltynjuk, H. Gleiter and H. Hahn, *Deformation-induced atomic rearrangements and crystallization in the shear bands of a Tb₇₅Fe₂₅ nanoglass*, Journal of Alloys and Compounds, 821 (2020) 153486-1-8.
25. Y. N. Fang, H. Hahn, S. Kobe, R. Witte, **S. P. Singh**, T. Feng and M. Ghafari, *Modifying the transition temperature, $120K \leq T \leq 1150K$, of amorphous Fe_{90-x}Co_xSc₁₀ with simultaneous alteration of fluctuation of exchange integral up to zero*, Scientific Reports, 412 (2019) 1-9.
24. **S. P. Singh**, J. F. Schneider, S. Kundu, A. C. M. Rodrigues, P. P. G. Mattos, E. D. Zanotto, J. Rocherullé, P. B. Rocherullé, R. Lebullenger, *Structure and ionic conductivity of nitrated lithium disilicate (LiSiON) glasses*, Materials Chemistry and Physics, 211 (2018) 438-444.
23. **S. P. Singh**, A. M. Rodrigues, H. D. Orsolini, P. P. G. de Mattos, E. D. Zanotto, J. Rocherullé, P. B. Rocherullé, R. Lebullenger, *Crystallization pathways and some properties of lithium disilicate oxynitride glasses*, Ceramics International, 43 (15) (2017) 12348-12356.
22. A. R. Molla, A. M. Rodrigues, **S. P. Singh**, R. F. Lancelotti, E. D. Zanotto, A. C.M. Rodrigues, R. Dousti, A. S.S. de Camargo, C. J. Magon, I. D. A. Silva, *Crystallization, mechanical and optical properties of transparent, nanocrystalline garnite glass-ceramics*, Journal of the American Ceramic Society, 100 (5) (2017) 1963-1975.
21. M. Montazerian, **S. P. Singh**, E. D. Zanotto, *A Statistical Overview of Glass-Ceramic Science and Technology*, American Ceramic Society Bulletin, 94 (4) (2015) 30-35.
20. **S. P. Singh**, M. Nath, B. Karmakar, *Quantum and dielectric confinements of sub-10 nm gold in dichroic phosphate glass nanocomposites*, Materials Chemistry and Physics, 146 (3) (2014) 198-203.
19. A. Sadhu, **S. P. Singh**, S. Bhattacharyya, *Direct Correlation of the Morphologies of Metal Carbonates, Oxycarbonates, and Oxides Synthesized by Dry Autoclaving to the Intrinsic Properties of the Metals*, Crystal Growth and Design, 14 (8), (2014) 4060-4067.
18. M. Garai, N. Sasmal, A. R. Molla, **S. P. Singh**, A. Tarafder, B. Karmakar, *Effects of Nucleating Agents on Crystallization and Microstructure of Fluorophlogopite Mica-Containing Glass-Ceramics*, Journal of Materials Science, 49 (2014) 1612-1623.
17. N. Sasmal, M. Garai, A. R. Molla, A. Tarafder, **S. P. Singh**, B. Karmakar, *Effects of Lanthanum Oxide on the Properties of Barium-Free Alkaline-Earth Borosilicate Sealant Glass*, Journal of Non-Crystalline Solids, 387 (2014) 62-70.

16. **S. P. Singh**, R. P. S. Chakradhar, J. L. Rao, Basudeb Karmakar, *Electron paramagnetic resonance, optical absorption and photoluminescence properties of Cu²⁺ ions in ZnO-Bi₂O₃-B₂O₃ glasses*, Journal of Magnetism and Magnetic Materials, 346 (2013) 21-25.
15. **S. P. Singh**, B. Karmakar, *Single-Step Synthesis and Surface Plasmons of Bismuth-Coated Spherical to Hexagonal Silver Nanoparticles in Dichroic Ag:Bismuth Glass Nanocomposites*, Plasmonics, 6 (2011) 457-467.
14. **S. P. Singh**, B. Karmakar, *In Situ Electron Beam Irradiated Rapid Growth of Bismuth Nanoparticles in Bismuth-Based Glass Dielectrics at Room Temperature*, Journal of Nanoparticles Research, 13 (2011) 3599-3606.
13. **S. P. Singh**, B. Karmakar, *Photoluminescence Enhancement of Eu³⁺ by Energy Transfer from Bi²⁺ to Eu³⁺ in Bismuth Glass Nanocomposites*, RSC Advances, 1 (2011) 751-754.
12. **S. P. Singh**, B. Karmakar, *Controlled Oxidative Synthesis of Bi Nanoparticles and Emission Centers in Bismuth Glass Nanocomposites for Photonic Application*, Optical Materials, 33 (2011) 1760-1765.
11. **S. P. Singh**, B. Karmakar, *Synthesis and Characterization of Low Softening Point High Bi₂O₃ Glasses in the K₂O-B₂O₃-Bi₂O₃ System*, Materials Characterization, 62 (2011) 626-634.
10. **S. P. Singh**, B. Karmakar, *Mechanochemical Synthesis of Nano Calcium Silicate Particles at Room Temperature*, New Journal of Glass and Ceramics, 1 (2011) 21-25.
9. A. Tarafder, **S. P. Singh**, B. Karmakar, *Effects of TiO₂-SiO₂ Fillers on Thermal and Dielectric Properties of Bismuth Glass Microcomposite Dielectrics for Plasma Display Panel*, Journal of Materials Science: Materials in Electronics, 22 (2011) 515-522.
8. A. Tarafder, **S. P. Singh**, B. Karmakar, *Environmentally Friendly and New Generation Glasses for Plasma TV*, Kanch, 4 (3) (2011) 42-48.
7. **S. P. Singh**, B. Karmakar, *Oxidative Control of Surface Plasmon Resonance of Bismuth Nanometal in Bismuth Glass Nanocomposites*, Materials Chemistry and Physics, 119 (3) (2010) 355-358.
6. **S. P. Singh**, R. P. S. Chakradhar, J. L. Rao, B. Karmakar, *EPR, FTIR, Optical Absorption and Photoluminescence Studies of Fe₂O₃ and CeO₂ Doped ZnO-Bi₂O₃-B₂O₃ Glasses*, Journal of Alloys and Compound, 493(1-2) (2010) 256-262.
5. **S. P. Singh**, R. P. S. Chakradhar, J. L. Rao, B. Karmakar, *EPR, Optical Absorption and Photoluminescence Properties of MnO₂ Doped 23B₂O₃-5ZnO-72Bi₂O₃ Glasses*, Physica B: Condensed Materials, 405(9) (2010) 2157-2161.
4. **S. P. Singh**, K. Pal, A. Tarafder, M. Das, K. Annapurna, B. Karmakar, *Effects of SiO₂ and TiO₂ Fillers on Thermal and Dielectric Properties of Eco-Friendly Bismuth Glass Microcomposites of Plasma Display Panels*, Bulletin of Materials Science, 33(1) (2010) 33-41.
3. **S. P. Singh**, K. Pal, A. Tarafder, T. Hazra, B. Karmakar, *Influence of SiO₂ and Al₂O₃ Fillers on Thermal and Dielectric Properties of Barium Zinc Borate Glass Microcomposites for Barrier Rib of Plasma Display Panels (PDPs)*, Transactions of the Indian Ceramic Society, 69 (2) (2010) 75-82.
2. M. Das, **S. P. Singh**, K. Pal, S. Jena, B. Karmakar, *Influence of Combined Al₂O₃-SiO₂ Filler on Thermal and Dielectric Properties of Barium Zinc Borate Glass Microcomposites for Barrier Ribs of Plasma Display Panels*, Indian Journal of Engineering and Materials Sciences, 17 (2010) 199-207.

1. B. Karmakar, T. Som, **S. P. Singh**, M. Nath, *Nanometal-Glass Hybrid Nanocomposites: Synthesis, Properties and Applications*, Transactions of the Indian Ceramic Society, 69 (3) (2010) 171-186.

Book Chapters:

1. **S. P. Singh**, B. Karmakar, Bismuth Oxide and Bismuth Oxide Doped Glasses for Optical and Photonic Applications Chapter 9 in *Bismuth: Characteristics, Production and Applications*, Nova Science Publication, New York, USA, 2011, ISBN: 978-1-61470-768-4.
2. T. Som, **S. P. Singh**, B. Karmakar, Plasmonic Antimony and Bismuth Oxide Glass Nanocomposites: Synthesis and Enhanced Photoluminescence, Chapter 9 in *Glass Nanocomposites*, Elsevier Publication, 2016, ISBN: 9780323393126.

Patents:

1. B. Karmakar, A. Tarafder, and **S. P. Singh**, "Low softening point lead-free transparent dielectric phosphate glass composition for plasma display panel and a process thereof", Indian Patent: 297733.

Conferences/Symposium:

18. **S. P. Singh**, H. Gleiter, H. Hahn, Nanoglass: a new class of nanostructured glassy materials, 25th International Congress on Glass, International Congress on Glass, 9th -14th June 2019, Boston, USA (*Invited*).
17. **S. P. Singh**, H. Gleiter, H. Hahn, Synthesis of Tb₇₅Fe₂₅ nanoglass and its magnetic properties, NANO2018, June 24-29, 2018, Hong Kong.
16. **S. P. Singh**, H. Gleiter, H. Hahn, Synthesis and characterization of Tb₇₅Fe₂₅ nanoglass, Spring Meeting of the DPG, March 11-16, 2018, Berlin, Germany.
15. **S. P. Singh**, S. Kundu, P. P. G. Mattos, A. C. M. Rodrigues, E. D. Zanotto; Silver Doped Lithium Disilicate Glass and Glass-Ceramics: Optical and Electrical Properties; Glass and Optical Division (2016 GOMD) Annual Meeting, The American Ceramic Society, May 22-26, 2016, Madison-WI, USA.
14. **S. P. Singh**, A. M. Rodrigues, H. D. Orsolini, E. D. Zanotto, J. Rocherullé, P. B. Rocherullé, R. Lebullenger; Crystallization Kinetics, Structural and Electrical Properties of Nitrogen-Containing Lithium Disilicate Glasses; 14th International Conference on the Physics of Non-Crystalline Solids, (PNCS-XIV), September 20-25, 2015, Niagara Falls, NY, USA.
13. **S. P. Singh**, L. S. A. Gallo, A. M. Rodrigues, C. E. Meo, E. D. Zanotto, J. Rocherullé, P. B. Rocherullé, R. Lebullenger; Crystallization Kinetics of Nitrogen-containing Lithium Disilicate Glasses; X BrasGlass – Brazilian Symposium on Glass and Related Materials, October 26-30, 2014, São Carlos – SP, Brazil.
12. **S. P. Singh**, B. Karmakar; Oxidative Synthesis of Transparent Bi₂O₃ containing Glass and their Enhanced Optical Properties for Optoelectronic Application; X BrasGlass – Brazilian Symposium on Glass and Related Materials, October 26-30, 2014, São Carlos – SP, Brazil.
11. **S. P. Singh**; Novel Oxidative Method for Enhancement of Photoluminescence of Dy³⁺ Ion in Bismuth Glass Nanocomposites for Photonic Application; Oral Presentation for the "Young

Scientists' Award Presentation in Materials Science Section" at 100th Indian Science Congress, Kolkata organized by Indian Science Congress Association, Kolkata, India during 3 – 7th January, 2013.

10. **S. P. Singh**, B. Karmakar; Controlled Oxidative Synthesis of Bi Nanoparticles and Enhanced Luminescence of Eu³⁺ in Bismuth Glass Nanocomposites for Photonic Application; Poster Presentation in the 1st International Workshop on Nanomaterials (IWON): Engineering Photon and Phonon Transport organized by School of Materials Science and Nanotechnology, Jadavpur University, Kolkata, India during December 14-15, 2012.
9. **S. P. Singh**; Solving Blackening Problem of Bismuth Oxide Glasses and Converting It into Several Scientific Gifts; Oral Presentation in the "Young Scientists' Colloquium 2012" organized by Materials Research Society of India (MRSI), Kolkata Chapter on 8th August, 2012 at CSIR-Central Glass and Ceramic Research Institute, Kolkata, India.
8. **S. P. Singh**, B. Karmakar; Surface Plasmon Resonance and Enhanced Photoluminescence of Rare-Earth by Bi-Species in Novel Bismuth Glass Nanocomposites; Oral Presentation in the "Research Scholars' Day" held at CSIR-Central Glass and Ceramics Research Institute, Kolkata, India on 18th July, 2012.
7. **S. P. Singh**, B. Karmakar; Shape and Size Dependent Optical Properties of Bismuth Coated Silver Nanoparticles in Ag-Bismuth Glass Nanocomposites; Oral Presentation in the "International Conference on Specialty Glass & Optical Fiber: Materials, Technology & Devices (ICGF-2011)" held at Central Glass and Ceramics Research Institute, Kolkata, India during 4th-6th August 2011.
6. **S. P. Singh** A. Tarafder, B. Karmakar; Preparation and Properties of Novel Environmentally Friendly Lead (Pb)-Free Glass Microcomposites for Barrier Rib and White Back Dielectrics of Plasma TV; Presented in the "International Conference on Specialty Glass & Optical Fiber: Materials, Technology & Devices (ICGF-2011)" held at Central Glass and Ceramics Research Institute, Kolkata, India during 4th-6th August 2011.
5. **S. P. Singh**, B. Karmakar; Synthesis and Properties of Low Softening Point High Bi₂O₃ Glasses for Optical and Sealing Applications; Presented in the "National Symposium on Ceramics: Energy and Environment" held at Hotel Taj Bengal, Kolkata, India, January 11-13, 2011.
4. **S. P. Singh**, B. Karmakar; New Synthesis Approach and Properties of Shape Controlled Bismuth Coated Silver Nanoparticles in Dichroic Ag:Bismuth Glass Nanocomposites; Presented in the "International Symposium on Advances in Nanomaterials (ANM2010)" held at Central Glass and Ceramics Research Institute, Kolkata, India during December 6-7, 2010.
3. **S. P. Singh**, B. Karmakar; Preparation and Properties of Bismuth Glasses in K₂O -Bi₂O₃-B₂O₃ system; Presented in the "International Workshop and Symposium on the Synthesis and Characterisation of Glass/Glass-ceramics (IWSSCGGC-2010)" held at C-MET, Pune, India, June 07-10, 2010.
2. **S. P. Singh**, K. Pal, A. Tarafder, M. Das, K. Annapurna, B. Karmakar; Effects of TiO₂ and SiO₂ Fillers on the Properties of Lead-free Environmental- friendly ZnO-Bi₂O₃-B₂O₃ Glass Microcomposites of Plasma Display Panels; Presented in the "National Symposium on Science and Technology of Glass/Glass-Ceramics (NSGC-08)" held at BARC, Mumbai, India, October 15-17, 2008.
1. **S. P. Singh**, participated in National Conference on Luminescence and its Applications (NCLA-2009) held at IACS, Kolkata, India during February 19-21, 2009.