

CURRICULAM VITAE

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Areas of Specialization: Materials Science

***Ph.D. Thesis Title:** Study of SiO₂- B₂O₃ based glasses and glass ceramics as sealants

ACADEMIC RECORD:

Degree and Specialisation	University/Institute	Year of Completion	Marks & Division
Fulbright Post Doctorate	Virginia Polytechnic and State University, Blacksburg, 24060 USA	2013	
Ph.D. (Physics & Materials Science)	Thapar University, Patiala	2010	
M.Tech Materials Science and Engineering	Thapar University, Patiala	2006	62.46%
M. Sc. (Hons) Physics	G.N.D.U Amritsar	2004	60.4%

Research Experience:

Year of Funding	Sponsoring Organisation	Title of Project	Position	Supervisor
Sept 2012-13	United States Indian Educational Fund	Study and development of materials for increasing the power generation efficiency of Solid Oxide Fuel Cells (SOFC)	Post Doctoral Fellow	Dr Kathy Lu
2009-2010	Council for Scientific and Industrial Research	Sealing materials for solid oxide fuel cell	Senior Research Fellow	Dr Kulvir Singh
2008-2009	DST*, Govt. of India	Development of sealant materials for solid oxide fuel cell	JRF/SRF	Dr Kulvir Singh

TEACHING EXPERIENCE:

Position Held	Name of Organisation	Period		Nature of Work
		From	To	
Assistant Professor	BhaiGurdas Institute of Engg. & Technology, Sangrur	Aug.2010	July 2012	Teaching/Research
Assistant Professor	Shri Guru Granth Sahib World University, Fatehgarh Sahib	July 2012	Contd	Teaching/Research

LIST OF PUBLICATIONS:

1. **Vishal Kumar**, AnuArora, O.P. Pandey and K. Singh, Studies on Thermal and Structural Properties of Glass Sealants for Solid Oxide Fuel Cell,**International Journal of Hydrogen energy**, **33 (2008), 434-438.**
2. **Vishal Kumar**, Sarita Sharma, O.P.Pandeyand K. Singh,Thermal and physical properties of 30SrO-40SiO₂-20B₂O₃-10A₂O₃ (A=La, Y, Al) glasses and their chemical reaction with bismuth vanadate for SOFC,**Solid State Ionics** **181 (2010) 79–85.**
3. **Vishal Kumar**, O.P.Pandey and K. Singh, Structural and optical properties of barium borosilicate glasses,**Physica B** **405 (1) (2010) 204-207.**
4. K. Singh, Indu Bala,**Vishal Kumar**,Structural optical and bioactive properties of calcium borosilicate glasses, **Ceramics International**, **35 (2009) 3401-3406.**
5. **Vishal Kumar**, O.P.Pandeyand K. Singh, Effect of A₂O₃ (A = La, Y, Cr, Al) on thermal and crystallization kinetics of borosilicate glass sealants for solid oxide fuel cells, **Ceramics International** **36 (2010) 1621-1628.**
6. Arora, **Vishal Kumar**, K. Singh and O.P.Pandey Thermal, structural and crystallization kinetics of ZnO-BaO-SiO₂-of A₂O₃ based glass sealants for solid oxide fuel cell**Ceramics International** **37(7) 2011, 2101–210.**
7. **Vishal Kumar**, O.P.Pandeyand K. Singh,Study on nucleation of crystalline phases in lanthanum borosilicate glass,**Transactions of Indian Ceramic Society**, **2011, 17-22.**
8. **Vishal Kumar**, GurbinderKaur, O.P. Pandey and K.Singh, Chemical interaction and thermal studies of calcium borosilicate glass sealants. **Physics and Chemistry of Glasses: European Journal of Glass Science and Technology Part B**, **52(5), 2011, 212-220.**
9. **Vishal Kumar**, Rupali, O.P. Pandey and K.Singh Thermal and crystallization kinetics of yttrium and lanthanum calcium silicate glass sealants for solid oxide fuel cell,**International Journal of Hydrogen Energy**,**36(2011) 14971-14976.**
10. G.Kaur, **Vishal Kumar**, O.P.Pandey, K.Singh, Thermodynamical and configurational stability of AO-SiO₂-B₂O₃-Y₂O₃ (A= Ca, Sr, Ba) glass sealants for SOFC, **Journal of Electrochemical Society** **159(3) (2012) B277-B284.**
11. G.Kaur, Poonam Sharma, **Vishal Kumar**, O.P.Pandey, K.Singh In vitro bioactive and optical study of calcium free zinc borosilicate glasses,**Material Science&Engg-C** **C32 (2012) 1941-47.**
12. **Vishal Kumar**, SachinTyagi, K.singh Optical and invitro bioactive properties of sodium silicate glasses**Indian Journal of Pure and Applied Physics (Press)**
13. G. Kaur, **V. Kumar**, D. Homa, B Scott, G. Pickerrel Correlation of glass stability and heating rate using inflexion point temperature (**Physics and Chemistry of Glasses European Journal of Glass Science and Technology Part B** 01/2014; 55(1).

14. **V.Kumar**, O.P.Pandey, K.Singh, and K. Lu Interaction study of yttria based glasses with high temperature electrolyte for SOFC, **Fuel Cells**, 14 (4) (2014) 635–644.
15. **V.Kumar**, G. Kaur, O.P.Pandey, K.Singh, and K.Lu, Effect of thermal treatment on chemical interaction between yttrium borosilicate glass sealants and YSZ for planar solid oxide fuel cells, **International Journal of Applied Glass Science** DOI: 10.1111/ijag.12078.
16. **V.Kumar**, G. Kaur, K.Lu G. Pickerrel, Interfacial compatibility of alumino-borosilicate glass sealants with AISI 441 and YSZ for different atmospheres, **International Journal of Hydrogen Energy** 40 (2) (2015)1195–1202.
17. G. Kaur, **V.Kumar**, O.P.Pandey, K.Singh, D. Homa and G. Pickerrel, Optical Mechanical and TEM assessment of titania doped $\text{Bi}_2\text{V}_{1-x}\text{Ti}_x\text{O}_{5.5-d}$ bismuth vanadate oxides, **Bulletin of Materials Science (Press)**.

PAPERS PRESENTED AT CONFERENCES

1. Studies on thermal and structural properties of glasses as sealants for solid oxide fuel cells, Vishal Kumar, O.P. Pandey and K.Singh **International Workshop on Hydrogen Energy, Jaipur (2006)**.
2. Thermal and structural properties of Sr based glasses as sealants for SOFC, Vishal Kumar, K.Singh and O.P. Pandey **Punjab Science Congress, Thapar University, Patiala, YSA-B7, Pg 151 (2008)**
3. Study on nucleation of crystalline phases in lanthanum borosilicate glass, Vishal Kumar, K.Singh and O.P. Pandey **72nd Annual session of Indian Ceramic Society, Jaipur Pg 65 (2009)**
4. Thermal and structural analysis of Mg based glasses as sealants for solid oxide fuel cell Vishal Kumar, K.Singh and O.P. Pandey **Recent Advances in Condensed Matter Physics, National Institute of Technology (Hamirpur) (2009)**
5. Thermal and crystallization kinetics of yttrium and lanthanum calcium silicate glass sealants for solid oxide fuel cells Vishal Kumar, Rupali, O.P. Pandey and K.Singh **Symposium on Fuel Cell Technology, Mumbai FUCETECH 2009**.
6. Thermal and structural study of chromium borosilicate ceramics for solid oxide fuel cell Vishal Kumar, O.P. Pandey and K.Singh **Annual General Meeting Materials Research Society of India Patiala (2012)**.

Member of Professional bodies

- (i) Member of Indian Association of Physics teachers (IAPT, Kanpur).
- (ii) Member of Materials Research Society of India (MRSI).
- (iii) Member, Paryavaran Welfare Society.
- (iv) Member, NSS Secretary Unit IV (2004-06), Thapar University, Patiala