Dr. (Mrs.) Satish M MANOCHA, F.G.S.A.
Professor
Department of Materials Science
Sardar Patel University,
Vallabh Vidyanagar–388120, Gujarat, INDIA

CURRICULAM VITAE OF SATISH M MANOCHA

1. Name in Full : **Dr. (Mrs.) Satish M MANOCHA, F.G.S.A.**

2. Date of Birth : October 02, 1952

3. Designation : PROFESSOR
   Department of Materials Science
   Sardar Patel University,Vallabh Vidyanagar–388120,
   Chairman: Board of Studies In Materials Science

4. Phone: (O) 02692-235183, 226853; ® 2692-236713, 9375012696;
   Fax: 02692-235183, 238355;
   E-Mail: sm_manocha@rediffmail.com

5. **Areas of Research :**

* Research & Development of Porous Carbons and activated carbon
* Research and Development of carbon based ceramics and composites
* Development of inorganic nanomaterials and nanocomposites
* Development of nanoclays and composites
* R&D of silver and HAP based nano biomaterials

6. Academic Qualifications :

B.Sc. (Hons)	1972	Chemistry	Delhi University
M.Sc.	1974	Chemistry	Delhi University
Ph.D.	1980	Science	I.I.T. Delhi

7. Professional experience

Positions held with Responsibilities

1979 – 82 S.R.A. I.I.T. Delhi

Surface and physico-chemical properties of Metal Oxides of first transition series

R& D on activated Carbon

March 82-August 85 ; S.S.O. II Department of Science and Technology

Scientific Co-ordination work under NCTCF program

1987-88 ; Research Associate, N.P.L. Delhi

Oxidation Resistant Ceramic Coatings on Carbon-Carbon Composites

1988 – 90 Fellow. CSIR - Tokten Program

1990 – 92 S.S.O. I at DSIR

1992 - 2000 Reader , Sardar Patel University

2000 – cont. Professor, Materials Science, Sardar Patel University

8. Awards/Honours received:

(i) **Elected Fellow of Gujarat Science Academy**
(ii) Hariom Asharam Prerit Inter University Best Paper Award in Materials Science 2002
(iii) Best Paper Award, MRSI 2000
(iv) Hariom Asharam Prerit Inter University Best Paper Award in Materials Science1998

9. Member, Professional Bodies

Member, Eecutive Council, Indian Carbon Society
Member, Eecutive Council, Materials Research Society of India (Gujarat Chapter)
Member, Advisory Committee, CGCRI - TIFAC Mission project
Member, Ceramic ware sectional committee CHD 9 of Bureau of Indian Standards
Executive Member, Prajana Editorial Board

10. Academic

No. of Ph.D. produced. : 10
No. of Ph.D registered : 7

11. Research & Development

***Total Research projects undertaken: National: 15*, sponsored by DST, AICTE, UGC, CSIR etc.**
International: 8, sponsored by NSF, USA; IFCPAR, TIT Japan etc.

11a) Processes Developed

(i) Process for development of nanoclays from Indian clays
(ii) Porous carbons and ceramics from banana stems
(iii) Porous carbons through template method
(iv) Inorganic-Carbon hybrid nanomaterials

List of few projects undertaken

A) As Principal Investigator

(i) Development of C,Si, N, based ceramics through sol-gel route (CSIR) 1995-98
(ii) Development of Porous carbons from Banana stem AICTE , 1998-2000
(iii) Development of Silica matrix composites (DRDL) 1998 - 2003
(iv) Development of Ceramic Matrix Composites through Sol-Gel route for Nuclear applications 1996-1998 (Deptt. of Atomic Energy)
(v) Development of carbon-metal complexes for bioapplications (UGC) 1998-2001

B) As Co-Investigator

(i) Co-cordinator, Centre of Excellence in Carbon related Nanomaterials Gujarat Council on Science and Technology, 2004-2006

(ii) Development of carbon/carbon composite tubes with tailored carbon matrix structure

2004 – Cont Sponsored by BRNS (DAE)

(iii) Development of High Thermal Conductivity Carbon/Carbon composites for Tokamak SST I
2000-2003 *Sponsored by* BRNS (DAE)

(v) Co-cordinator, Centre for advanced Studies; UGC-SAP programme 1994 – Cont. in Materials Science; Development of carbon/carbon Composites and carbons for for bio-applications.

(v) Development of Oxidation Resistant Carbon/carbon Composites 1996-2000 sponsored by ARDB, DRDO

Recent completed Projects

(i) Development of nanoporous carbons for adsorption of Krypton and Xenon
(DAE)

(ii) Development of nanoclays and their composites
(UGC)

(iii) Development of nanoporous carbons through template method (UGC)

(iv) Development of nanosilver reinforced composites for bioapplications (UGC)

11b) INTERNATIONAL COLLABORATION PROJECTS

(i) Microstructural studies on Carbon Nanomaterials modified carbon-carbon composites
2005-08 (NSF-DST, USA)

(ii) To enhanced oxidation resistance of carbon matrix in Carbon-carbon composites
2005 -06 (Honeywell Corporation)

(iii) Carbon gasification in carbon/carbon composites
1996-2000; by Indo-French Center for Promotion of Advance Research (IFCPAR-CEFIPRA)

(iv) Studies of Fiber Matrix Bonding and Physical Properties of Carbon-Carbon Composites Made with Carbon Fibers of Different Morphologies
1996-2000 by NSF, USA

(v) Development of multielement ceramics through sol-gel route
1999-2000 By International Collaboration Cell, TIT, Japan

(vi) Fiber matrix interactions in SiC fiber reinforced Ceramic matrix Composites through sol-gel route
2000-2001 By International Collaboration Cell, TIT, Japan

(vii) Oxucarbides through sol-gel route
2001-2002 By International Collaboration Cell, TIT, Japan

11c) Consultancies given for Commercial Exploitation

Enhancement of oxidation protection of C/C Composites – Honeywell corporation, USA (Continuing)

Adsorbing carbon materials
(Industrial Carbons, Ankleshwar)

Gem - Industrial waste utilization from Khambat region
(Small scale Industries)

Adsorbing silica materials
(Nadiad)

Significant Research and Teaching Work by Prof. S.Manocha in related field

Prof. (Mrs) S. Manocha has done significant research work pertaining to activated carbon, metal- carbon complex composites, ceramics, ceramic coatings and ceramic matrix composites through sol-gel route, and development of value based materials from waste materials, nanosilver and HAP materials.

Activated carbon is one of the important industrial carbons required for various type of industries as well as for environmental pollution control. Prof. (Mrs.) Manocha is engaged in this area for last ten years. Prof. (Mrs.) Manocha and her group has carried out exhaustive research work on the development of activated carbon from various waste biomass such as Banana stem, bagasse, Babool, Eucalyptus, Pine etc for production of activated carbon of known porosity and pore structure. Metal-carbon complexes developed by her using silver, shows excellent antibacterial properties. These results, presented by her at International Conference on Carbon Alloys, Tokyo, Japan were highly appreciated. The work is published in International journals. Three students have done Ph.D in the area of porous carbons under her guidance.

Using template method, she developed porous activated carbon with controlled porosity of 1-2 A for adsorption of krypton and xenon, to be used in future reactors by IGCAR, a problem of National importance.

She established sol-gel lab at the Department for development of both pure and mixed type ceramics as well as ceramic matrix composites. The research work carried out on development of high temperature oxidation resistant ceramic coating for C/C composites resulted in raising the onset temperature from 480^{o}C for uncoated sample to 650^{o}C for coated sample. The work was done for Missile program of DRDO. Silica based ceramics were developed by inorganic- organic hybrid method through modification of tetrahedron of silica by incorporation of carbon and nitrogen. Also value added products using fly ash have been developed both as a refractory and road construction materials.

She was invited by Tokyo Institute of Technology, Japan as Visiting Researcher to work on Porous Carbons. She has delivered Invited Talks at various National and International forums including Institutes in Japan, Korea, France, USA etc. as well as in International Conferences on Porous carbons. She visited CNRS, Mulhouse, France as a Principal Co-Investigator under CEFIPRA sponsored project on Gasification of Carbons.

She has been associated with organization of various Conferences, International meetings at Department of Materials Science of Sardar Patel University. She has made significant contributions to Materials Science education. She was the first to be identified as UGC course co-ordinator for UGC sponsored Refresher Course in Materials Science and has organized four refresher courses which were attended by college and University teachers of western region and they in turn promoted Materials Science in their Institutes.

She has been expert member on various DST, UGC, IBS and CSIR committees.

She is a Fellow of Gujarat Science Academy and Executive member of Carbon Society of India and Materials Research of India.

She is a Fellow of Gujarat Science Academy and Executive member of Indian Carbon Society and Materials Research of India (Gujarat chapter). She is recipient of several awards including Materials Research Society of India Medal and Sardar Vallabh bhai Patel International award for technology.

List of Publications

1. **Adsorption behavior of Carbon from Biomes**
   S. Manocha, Lalit M. Manocha
   Adsorption Science & Technology world Scientific Publication PP 727-732 (2001)
2. **Studies on Pyrolysis behavior of Banana Stem as precursor for biomes carbon**
   S. Manocha Jignesh Bhagat, L.M. Manocha
   Carbon Science Vol. 2 (2) pp91-98 (2001)
3. **Studies on development of porosity in Carbon from different Bio-waste**
   Satish M .Manocha, Vanraj B. Chauhan and L.M.Manocha
   Carbon Science
4. **Porous Carbon from Biowastes**
   S. Manocha, L.M. Manocha
   Advances in Carbon & Carbon Materials (2001) pp 48-57
5. **Multilayer oxidation Resistant Coating on C/C composites by CVR and Sol-Gel Route**
   L.M.Manocha, Alpesh Patel and S.Manocha
   Advances in Carbon & Carbon Materials (2001) pp 166-176
6. **Ceramic Coatings on Carbons using Electrophoresis Depositors**
   S. Manocha and L. M. Manocha
   Advances in Carbon & Carbon Materials (2001) pp 177-184
7. **Studies on Mechanical and Electrical Preparation of graphite filled polymer**
   S.Manocha &. L. M. Manocha
   Advances in Carbon & Carbon Materials (2001) pp 185-193
8. **Silver Uptake by Modified Pitches**
   S. Manocha and Mitesh Patel
   Carbon Science, Vol. 3 No.1 pp 13-16 (2002)
9. **Co-Graphitization of fibers and Matrix in Carbon-Carbon Composites with controlled Interfaces**
   L.M.Manocha and S. Manocha
   Ceramic Engineering and Science Proceedings, Vol. 23 No.3 pp 347-354 (2002)
10. **Microstructure and properties of fiber reinforced Mixed Carbide Composites prepared through Sol-Gel Route.**
    L. M. Manocha & S. Manocha, E.Yasuda, Y Tanabe & Fukushima
    Ceramic Engineering and Science Proceedings, Vol. 23 No. 3 pp. 411-418 (2002)
11. **Porous Carbon from Biomass**
    S. Manocha
    Advanced Applications for Carbon materials, pp. 57-69 (2002)

12. **Functionally graded ceramic coatings for oxidation protection of C-C composites**
    L.M.Manocha, S. Manocha
    Functionally graded Materials, NML, DRDO, pp21-30
13. **Synthesis via pyrolysis and Characterization of Si-C-O Ceramics**
    L.M.Manocha & S. Manocha
    Journal of Ceramic Society of Japan, Vol. 110 (12) 00.1044-1047 (2002)

14. **Reactivity of wet air of Carbon-composite with Treated pitches**
    C.Vix-Gutrel, G. Bekri, J. Dentzer, S. Manocha, L. M. Manocha, P. Ehrburger
    Journal of Anal Application Pyrolysis, Vol. No. and Issue No. 67, p.p-341-347. 2003
15. **Microstructure of Carbon- Carbon composite reinforced with pitch based ribbon shape carbon fibers**
    L. M. Manocha, Ashish Warrier, S. Manocha, D.D. Edie, A.A. Ogale,
    Vol. No. and Issue No. 41, p.p-1425-1436, 2003
16. **Development of Carbon Nanomaterials through Chemical Routes**
    L.M.Manocha, Jignesh Valand, S.Manocha and Ashish Warrier
    Indian journal of Physics, Vol.78A (2), 159-163, 2004
17. **Effect of Substrate and Catalyst on Formation of Aligned Carbon Nanotubes by CVD Technique**
    L.M.Manocha, Jignesh Valand, S.Manocha and Ashish Warrier
    Transactions of Material Research Society of Japan, 29 (8), 3569-3572, 2004
18. **High Thermal conductivity Carbon/carbon composite**
    L.M.Manocha, Ashish Warrier and Satish Manocha
    Proceeding of HTCM-5 American Ceramic Society, Sept.2004
19. **Development of carbon ceramic composite from fly ash**
    Satish Manocha, L.M.Manocha and Rakesh Patel
    Proceeding of HTCM-5 American Ceramic Society, Sept.2004
20. **Development of nano Structural Multielements Ceramic matrix composites through sol-gel route**
    L.M.Manocha, Satish Manocha, Bharat Patel
    Proceeding of HTCM-5 American Ceramic Society, Sept.2004
21. **Influence of High pressure Impregnation and carbonization of carbon/carbon Composite**
    L.M. Manocha, Ashish Warrier and S.Manocha
    Proceeding of International workshop on Carbon Materials for Energy Applications, p.p 238-247, Dec.2004
22. **Effect of carbonaceous Pressure on the Growth Of carbon Nanomaterials Through CVD route**
    L.M.Manocha, Jignesh Valand and S.Manocha
    Proceeding of International workshop on Carbon Materials for Energy Applications, 138-146, Dec.2004

23. **Development of multiphase carbide during carbothermal reduction of Fly Ash/Phenolic composite at high temperature**
    S.Manocha, Rakesh Patel
    Proceeding of International workshop on Carbon Materials for Energy Applications, 319-325, Dec.2004
24. **Hydrogen sulphide Adsorption characteristic of different Activated Carbon fabric.**
    S. Manocha, Raviraj K. Shah
    Proceeding of International workshop on Carbon Materials for Energy Applications, 452-459, Dec. 2004
25. **Carbon Metal complex Alloys for Environmental Protection**
    S. Manocha, Mitesh Patel, RaviRaj Shah, L. M. Manocha
    Journal of Ceramic Society of Japan, Vol.No. and Issue No. 112(5), p.p – 1525- 1530,2004
26. **Development of multi- Element nanostructured Ceramics through solution Route**
    S. M. Manocha
    Indian Journal of Physics, 78A(I), p.p-111-114, 2004
27. **Mechanical Properties of carbon/carbon composite densified by H/P technique**
    L.M.Manocha, Ashish Warrier, S. Manocha, S. Banerjee and D. Sathiyamoorthy
    Carbon Science, Vol. 6 (1), 2005, PP 6-14.
28. **Role of Metal Catalyst and Substrate Site for the Growth of Carbon Nanomaterials**
    L.M. Manocha, Jignesh Valand and S. Manocha
    Carbon Science, Vol. 6 (2), 79-85, 2005.
29. **Varieties of Carbon Nanomaterials Formation and Their Characterizations**
    L.M. Manocha, Jignesh Valand and S. Manocha
    Journal of Pure & Applied Sciences – “PRAJNA”, Vol. 13, p.76-88, 2005.
30. **Preparation and Characterization of Activated Carbon Fabric from Rayon based Precursor Material.**
    S. Manocha and Raviraj K. Shah
    Journal of Pure and Applied Science - “PRAJNA”, Vol. 13, 89-95, 2005
31. **Fly Ash – A Suitable Raw Material for Carbon Ceramic Composites**
    S. Manocha, Rakesh Patel, L. M. Manocha
    In the Proceedings of 69th annual session of Indian Ceramic Society, Jamshedpur held on 28, 29 Dec. 2005
32. **Studies on Characterization and Modification of Indian clays to Develop Smectite.**
    S. Manocha. Nikesh A. Patel, Jignesh Panchal and L.M.Manocha
    In the Proceedings of 69th annual session of Indian Ceramic Society, Jamshedpur held on 28-29 Dec 2005.

33. **Effect of Nitrogenated compound and Heat treatment temperature on Carbonization behaviour and Optical texture of Pitches**
    L.M.Manocha, Rakesh Raj & S. Manocha
    International Carbon Conference, 2005
34. **Oxidation Behavior of Ribbon shape Carbon fibers and their Composites**
    L. M. Manocha, A.Warrier, S.Manocha, D.D.Edie, A.A. Ogale
    Materials Science & Engineering, Vol.132 (1-2) 2006, 12-125
35. **Thermophysical properties of densified pitch based carbon/carbon materials-I**
    L.M.Manocha, Ashish Warrier, S.Manocha S.Banerjee & Sathiya Moorthy
    Unidirectional Composites, Carbon, Vol-44 (Issue 3) 2006, 480-487
36. **Thermophysical properties of densified pitch based carbon/carbon materials-II**
    L.M.Manocha, Ashish Warrier, S.Manocha S.Banerjee & Sathiya Moorthy
    Bidirectional composites, Carbon, Vol-44 (Issue 3) 2006, 488-495
37. **Nanocomposites for Structural Applications**
    L.M.Manocha, Jignesh Valand, Nikesh Patel, Ashish Warrier & S.Manocha
    Indian Journal of Pure and Applied Physics, Vol.44, 2006, P 135-142
38. **Formation of Carbon Nanostructure During Pyrolysis of Polymers**
    L.M.Manocha, Jignesh Valand and S.Manocha
    International Journal of Nanoscience (IJN), Vol.5, 2006, P 89-95
39. **Effects of Chemical Activation on deodorizing properties of Activated Carbon from Banana Stem**
    J.H. Bhagat, S.Manocha
    Journal of Pure and Applied Science- Pragna (press)
40. **Porous carbon with controlled pore size through template method**
    S.Manocha, Narendra Movaliya and L.M.Manocha
    National Conf. on carbon ,33-39 ,2006
41. **Isotropic Carbon-Carbon Composites with Chemically Modified Pitches**
    L.M.Manocha, Rakesh Raj, S.Manocha, and D. Sathiyamoorthy
    12th European Conference, France, Sept.2006
42. **Carbon-Carbon Composites with Chopped Carbon Fibers Microstructure and Mechanical Properties**
    L.M.Manocha, Rakesh Raj, S.Manocha & D.Sathiyamoorthy
    National Conf. on carbon ,225-233 ,Nov.2006
43. **Methylene Blue adsorption study on microporous activated carbon**
    S. Manocha and Amit Brahmbhatt
    National Conf. on carbon, 92-97 Nov. 2006
44. **Synthesis of aligned carbon nanotubes films by floating catalyst chemical vapor deposition method**
    L.M.Manocha, Harshad Patel and S.Manocha
    National Conf. on carbon, 174-180, Nov.2006

45. **Studies on pore characteristics of microporous carbons prepared with different types of silica templates**
    S. Manocha and Narendra Movaliya
    Carbon Science Vol. 8, (1), March 2007, pp 17-24
46. **Silicon Carbide coating on Graphite and Isotropic C/C Composites by Chemical vapor Reaction**
    L.M. Manocha, Bharat Patel, and S. Manocha
    Carbon Science, Vol. 8 (2), 2007, 91-94
47. **Development of Composites Incorporating carbon nanofibers and Nanotubes**
    L.M. Manocha, Jignesh Valand, and S. Manocha
    Journal of Nanoscience and Nanotechnology, Vol. 7, 2007, 1845-1850
48. **Pore Structure and Morphology Study of Microporous Carbons Prepared by Template Method**
    S. Manocha and Narendra Movaliya
    Under Communications in Carbon Letter
49. **Development and Characterization of Nanoclays from Indian Clays**
    S. Manocha, Nikesh Patel and L.M. Manocha
    Defence Science Journal-Special Issue on Nanomaterials, Vol. 58, No. 4, 517- 524(July 2008)
50. **Synthesis of Highly Uniform shape copper Particles and Crystals Using Propylene Glycol**
    L. M. Manocha, Imad Ali Disher and S. Manocha
    Journal of Advanced Science Letter, 2, 50 – 54 (2009)
51. **Development of Carbon/Carbon Composite with Carbon Nanotubes as Reinforcement and CVI Carbon as a Matrix**
    Lalit Mohan Manocha, Harshad Patel, S. Manocha, Ajit Roy and J. P. Singh
    Journal of Nanoscience and Nanotechnology, Vol. 9, 31119-3124 (2009)
52. **Effect of Carbon Nano reinforcement on Microstructure of Carbon matrix materials**
    L. M. Manocha, H. Patel, R. Pande and S. Manocha
    Nanostructured Materials and Nanotechnology –II, Wiely,.131-138 – (2009)
53. **Effect of Addition of Nanomaterials on Matrix Microstructure and Thermal Conductivity of Carbon - Carbon Composites**
    Lalit Mohan Manocha, Rajesh Pande, Harshad Patel, S. Manocha, Ajit Roy J. of Advance Materials (accepted)
54. **Synthesis of carbon Spherules during pressure Carbonization of Pitch**
    L.M. Manocha, Rakesh Raj and S. Manocha
    Under Communications in Materials Chemistry and Physics (Elsevier publication)
55. **Microstructure and Properties of three phase Carbon and Ceramic matrix Composites**
    L. M. Manocha, M. M. Vyas, S. Manocha and P. M. Raole
    Ceramic Society of Japan, special volume “Key Engineering Materials

published by Trans Tech publication inc. (Accepted)

56. **Effect of additional Reinforcement on the Properties of Ceramic matrix Composites**

    L. M. Manocha, M. M. Vyas, S. Manocha and P. M. Raole
    Journal for pure and applied science-PRAJNA, Sardar Patel University journal. (in communication)

57. **Synthesis and Raman Characterization of Multiwalled Carbon Nanotubes by Catalytic Chemical Vapour Deposition**

    L.M. Manocha, Arpana Basak, S. Manocha
    Journal of Pure and Applied Sciences, *Prajna*, 18, p. 102-105, 2010

58. **Oxidation-Reduction of Natural Graphite- A Step towards Synthesis of Graphene**

    L. M. Manocha, Hasmukh Gajera, Vishal Makadia and S. Manocha,
    Journal of Pure and Applied Sciences - *PRAJNA,* 18, p. 92-97, 2010

59. **Development of Carbon foam from Phenolic resin via template route**

    Satish M. Manocha, Kalpesh Patel and L.M. Manocha
    Indian Journal of Engineering and Materials Science, Vol. 17,p. 338-342, 2010

60. **Activated Carbon from waste biomass of Psyllium husk:Effect of steam activation of surface characteristics**

    Satish M. Manocha, Ajay Chavda, Paramvirsinh Punvar and Kalpesh Patel
    Prajna – Journal of pure and applied sciences, Vol. 18, p. 88-93, 2010

61. **Development of Reticulated carbon foam: An attractive material**

    Satish M. Manocha and Kalpesh Patel
    Prajna – Journal of pure and applied sciences, Vol. 18, p. 98-101, 2010

62. **Effect of Steam Activation Parameters on Characteristic of Pine based Activated Carbon**

    S. M. Manocha*, Hemang Patel, L.M.Manocha
    Carbon Letters, Volume 11, No.3, p. 201-205, September 2010

63. **Effect of steam activation on development of Light weight biomorphic porous SiC from Pine wood precursor**

    S. M. Manocha*, Hemang Patel, L.M.Manocha
    Journal of Materials Engineering and Performance, (Submitted 2nd September 2010)

64. **Enhancement of Microporosity through Physical activation**

    S. M. Manocha*, Hemang Patel, L.M.Manocha
    PRAJÑĀ - Journal of Pure and Applied Sciences, Vol. 18, p. 106 – 109, 2010

65. **Porous SiC ceramic from Pine wood charcoal**

    L.M.Manocha *, Hemang Patel, S. M. Manocha
    Proceeding in 35th International Conference on Advanced Ceramics & Composites
    (ICACC-2011) Published by American Ceramic Society