Akshay Kumar

Materials Science: Nanomaterials

Objective: *Seeking an opportunity as a Materials Scientist in the challenging environment of Research and Education Development.*

Education

2007–2011
Ph.D. in Materials Science — Thapar University, Patiala.
Preparation and Characterization of Tungsten Carbide Micro/Nano Composites

2003–2005
M.Sc. in Applied Physics — Punjabi University, Patiala.
Specialization: Material Science

2000-2003
B.Sc. in Non-Medical — D.A.V. College, Kangra (HPU).
Physics, Chemistry and Mathematics

Experience

Dec 2011–Present
Assistant Professor — Department of Nanotechnology, Sri Guru Granth Sahib World University, Fatehgarh Sahib (140406) Punjab (INDIA)

April 2010 – September 2011
Senior Research Fellow — School of Physics and materials Science (SPMS) Thapar University Patiala. Punjab (INDIA)

July 2009- March 2010
JRF (UGC Meritorious fellowship) — SPMS Thapar University Patiala.

July 2007-June 2009
Teaching Assistant — SPMS Thapar University Patiala.

March 2006- June 2006
Lecturer (Contractual) — SPMS Thapar University Patiala.

Research interests

Basic idea is to synthesize new materials by green synthesis for different applications.

I am working on the synthesis and characterization of boron based compounds for their applications in cancer treatment by targeted drug delivery and boron neutron capture therapy (BNCT). The project is in association with Babha Atomic Research Centre (BARC) and Central Scientific Instrumentation Organization (CSIO) Chandigarh. I am also working on the materials for chemical gas sensors and for solar cell application.

Contact

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Languages

Hindi mother tongue
Punjabi and English fluency

Personal

Married and have a son

Akshay Kumar

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number crunching

Conf./workshops: 12
Journal Citations: 50+
Publications: 11
H-index: 3
I-10: 3

Ongoing Projects

Synthesis and applications of Boron Carbide Nanoparticles for Neutron Capture Cancer Treatment Therapy,
DEPARTMENT OF ATOMIC ENERGY (DAE), BOARD OF RESEARCH IN NUCLEAR SCIENCES (BRNS).
Cost: 20.19 Lakh

Skills & interests

Instruments Handling

XRD,TEM, SEM, DT/TGA, FTIR, UV-Visible, Particle size analyzer, Photoluminescence Spectrometer. High temperature furnaces, planetary ball mill etc.

OS/Softwares

Windows, Office, Latex, Origin, Fullprof_Suit, X'Pert Highscore Plus, PCPDFWIN, POWDEL, Standard Analysis (Thermal).

Personal: music, basketball, photography, travelling.

Awards

2014
Best Poster Award at MRSI- 2014 held at IISc- Banglore.
2010
Council of Scientific and Industrial Research, Senior Research Fellowship
2009
Meritorious Scholarship (UGC) Thapar University, Patiala (India).
Awarded to the top selected Ph.D. students.
2007
Thapar University Fellowship
Awarded to the top selected Ph.D. students.
2007
Best Poster award at International Conference on Metals and Alloys: Past, Present & Future (METALLO)

Invited Lectures

- Transition Metal Carbides: traditional materials with new role in present scenario Innovative Trends in Technology and management (MNCITSM-2014) 5-6 July 2014 Sri Sai University Palampur.
- Synthesis of highly water soluble nanostructured Boron Nitride for anticancer drug delivery, Industrial Engineering 2014, 8-10 December, San Francisco, USA.

Thesis guided/guiding

Ph. D: 04 (ongoing)
M. Tech: 03 completed/01 ongoing

Workshop/ Seminar

NRC-M workshop on Biomaterials, 23-25 May 2014, at Department of materials Engineering IISc. Bangalore.
Materials Characterization by Thermal Analysis by NETZSCH Technologies India, 9 Oct. 2014, Chandigarh.

References

Dr. O.P. Pandey
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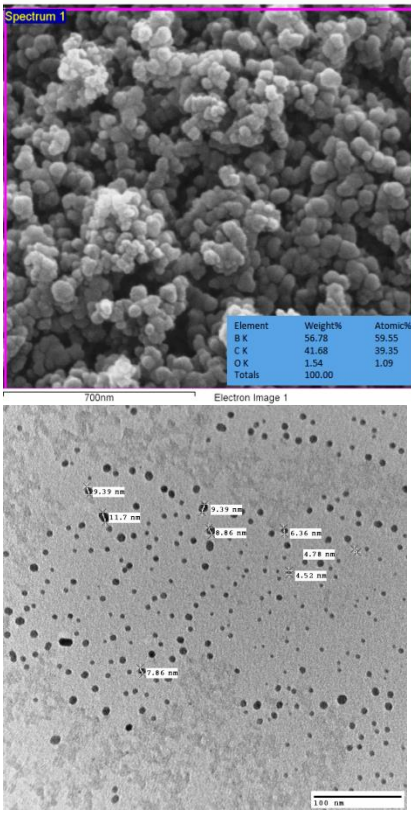
Achievements in Design

Autoclave for synthesis of nanostructured carbide/nitride or sulphides of Transition Metal.

Highlights



SEM& TEM of boron carbide nanoparticles

Publications

Books

"Nanostructured Tungsten Carbide and its Composites with Cobalt" (ISBN 978-3-8484-9826-0), LAMBERT Academic Publishing GmbH & Co. Germany (2012)

Publication in Journals

[1] Manjeet Kumar, **Akshay Kumar**, A. C. Abhyankar, Occurrence of non-equilibrium orthorhombic SnO_2 phase and its effect in preferentially grown SnO_2 nanowires for CO detection, RSC Advances (under review)

[2] Manjeet Kumar, **Akshay Kumar**, A. C. Abhyankar, W-doped nanocrystalline SnO_2 thin films for NO_2 Sensing: Effect of texture coefficient, roughness and crystallite size, ACS Applied Materials and Interface (under review).

[3] Paviter Singh, Bikramjeet Singh, Manjeet Kumar, **Akshay Kumar,** One step reduction of Boric Acid to boron carbide nanoparticles, Ceramics International 40 (2014) 15331–15334

[4] Manjeet Kumar, **Akshay Kumar,** A.C. Abhayankar, SnO_2 based sensors with improved sensitivity and response time, Ceramics International 40 (2014) 8411–8418

[5] **Akshay Kumar**, K. Singh and O.P. Pandey, Synthesis of carbon nano tubes by thermo-chemical method, J. Mater. Sci. Technol., 2014, 30(2), 112-116.

[6] Raj Kumar, **Akshay Kumar,** Sukhbir Singh, O.P. Pandey, Reduction of WO3 to WC nano particles by reflux reaction, Materials Science, Vol. 49, No.1, July, 2013 (Ukrainian Original Vol.49, No.1, January–February, 2013).

[7] **Akshay Kumar**, K. Singh and O.P. Pandey, Direct conversion of wolframite ore to Tungsten Carbide nano particles, Int Journal of Refractory Metals and Hard Materials, 29 (2011) 555-558.

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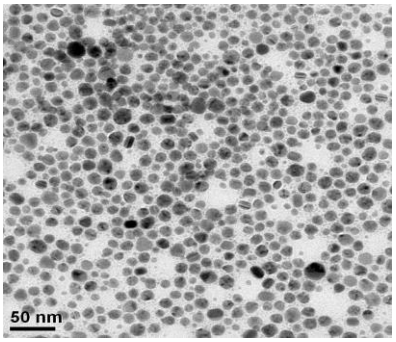
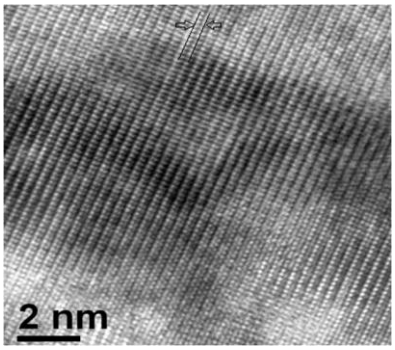
Highlights





HRTEM of Tungsten carbide particles

[8] **Akshay Kumar**, K. Singh and O.P. Pandey, Sintering behavior of Nanostructured WC-Co composite, Ceramics International, 37 (2011) 1415-1422.

[9] R. Kumar, R. Srivastava, **A. Kumar**, M. N. Kamalasanan, K. Singh. Green-light–emitting electroluminescent device based on a new cadmium Complex, Euro Physics Letters, 90 (2010) 57004.

[10] **Akshay Kumar**, K. Singh and O.P. Pandey, Optimization of processing parameters for the synthesis of tungsten carbide (WC) nanoparticles through solvo thermal route, Physica E- Low Dim Phys and Nano structures, 42 (2010) 2477–2483.

[11] **Akshay Kumar**, K. Singh and O.P. Pandey, Reduction of WO3 to nano-WC by thermo-chemical reaction route, Physica E- Low dim Phys and Nano structures, 41 (2009) 677–684.

[12] **Akshay Kumar**, K. Singh and O.P. Pandey, Development Of Nanocomposite WC-Co Materials-An Overview, Nano Science and Nano Technology-An Indian J 1(2), (2007) 59-69.

Publication in Conference Proceedings

[1] Amandeep Kaur, Tanish Gupta, **Akshay Kumar**, Sanjeev Kumar, Karamjeet Singh, Anup Thakur, Electrochemical Synthesis of Highly Crystalline Copper Nanowires, AIP Conference Proceeding (Accepted) 2014.

[2] Bikramjeet Singh, Paviter Singh, Manjeet Kumar, Anup Thakur, **Akshay Kumar**, Single Step Synthesis of Nanostructured Boron Nitride for Boron Neutron Capture Therapy, AIP Conference Proceeding (Accepted) 2014.

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Presentations in Conference:

[1] **Akshay Kumar**, K. Singh, O.P. Pandey, Synthesis of Nano size WC-Co Composite by Carbothermic Reduction, **International Conference** on Metals and Alloys: Past, Present & Future (METALLO 2007) **Third Prize.**

[2] **Akshay Kumar**, K. Singh, O.P. Pandey Synthesis and Characterization of Nanocomposite WC-Co Materials, National Conference on Emerging Trends in Engineering materials, Feb 2007, Thapar Institute of Engineering & Technology, Patiala.

[3] **Akshay Kumar**, K. Singh, O.P. Pandey, Synthesis of Tungsten Carbide nano crystals by thermo chemical route, Punjab Science Congruence Feb. 2008 held at Thapar University Patiala.

[4] **Akshay Kumar**, K. Singh and O.P. Pandey, Microstructural examination of sintered nano-structured WC-Co composite, Materials research Society of india 22 meet, Feb 2011.

[5] Raj Kumar, **Akshay Kumar** and O.P. Pandey Synthesis of WC nano particles by reflux reaction, Materials research Society of india 22 meet, Feb 2011.

[6] **Akshay Kumar**, K. Singh and O.P. Pandey, Effect of sintering temperature, time and binder composition on microhardness of WC-Co nanocomposites, **International Conference** on Recent Trends in Physics (4 – 5 February 2012) School of Physics, Devi Ahilya University, Indore INDIA

[7] **Akshay Kumar**, K. Singh and O.P. Pandey, Synthesis of carbon nano tubes by thermo-chemical method, **International Conference** on Emerging Trends in Physics for Environmental Monitoring & Management (ETPEMM-12) 17-19, December 2012.

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[8] Rajni Bala, **Akshay Kumar**, Theoretical modelling on the grain growth process of WC-Co nano composites, Science: Emerging Scenario and Future Challenges, 8-10 March, 2013, Shoolini University Solan.

[9] Rajni Bala, Paviter Singh, **Akshay Kumar,** Theoretical aspects of the sintering behavior of WC/Co nano composites, National Confrence on Nanoscience and Instrumentation Technology, 28-29 march 2013.

[10] Paviter Singh, Bikramjeet Singh, **Akshay Kumar,** Synthesis of Boron carbide nanoparticles by solvothermal route. Emerging Horizon in Science and Technology January 17-18, 2014.

[11] **Akshay Kumar**, P. Singh, B. Singh, R. Bala, R. Kaur, K. Singh and O. P. Pandey Micro-Hardness Analysis of Nano Composites Synthesized Using WC- Co Nanoparticles Advances in Materials Science for Energy Applications AMSEA-2014.

[12] Rajni Bala, **Akshay Kumar,**Texture coefficient analysis to boron carbide nanostructures, 2nd Annual Confrence on Science: Emerging Scenarioo Future Chellenges-II 17-18 May 2014.

[13] Manjeet Kumar, **Akshay Kumar**, A. C. Abhyankar, Effect of Texture coefficient on nanocrystalline SnO_2 based sensors for NO_2 sensing, MRSI AGM-25 , 12-14 Feb 2014 at IISc Banglore.

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