


Brief Biodata

Dr. Khem Singh

Designation:	Sr. Technical Officer -2	
DP No. and Name:	3.02-Gas Metrology	
DU No. and Name:	3.0- ESBMD	
Email:	khem008@nplindia.org	
Date of Joining CSIR-NPL:	15-10-1997	
Phone (office)	+91 11 47091368	
Mobile (optional)	-	

Research Area/ Interest

- ✚ Gas and Particulate matter Metrology
- ✚ Development of Primary Gas Mixture Standards (BNDs), Homogeneity and Stability studies
- ✚ Determination of impurity in gas mixtures

Educational Qualifications

(Please write latest qualification first)

Degree	Subject	University/ Institute	Year
Ph.D.	Physics	Jamia Millia Islamia (JMI)	2011
M.Sc.	Physics	Aligarh Muslim University (AMU)	1997
B.Sc.(Hons.)	Physics	Aligarh Muslim University (AMU)	1995
DL101 General Course on Intellectual Property	IPR	WIPO, Geneva	2013

Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Sr. Tech. Officer-2	CSIR-NPL	2016	Cont.	Gas metrology, gas mixtures & particulate matter measurements, development of gas mixture standards by gravimetric method
Sr. Tech. Officer-1	CSIR-NPL	2011	2016	Trace metal analysis using AAS and ICP OES, Measurement Uncertainty in Chemical analysis, Physico-Chemical characterization of Atmospheric aerosol, Gas Metrology, Testing of Indelible Ink
Sr. Tech. Asstt	CSIR-NPL	2002	2007	Testing and Characterization of Chemicals, Testing of Indelible Ink

Tech. Officer	CSIR-NPL	2007	2011	Testing and Characterization of Chemicals, Environmental studies, Testing of Indelible Ink
Tech. Asstt	CSIR-CIMFR	1997	2002	Testing and Characterization of Chemicals

No. of Publications : 26

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
26		47	1	74

Selected Publications

1. Preparation and Certification of Indian Reference Material of Bituminous Coal, T. B. Das, U. S. Chattopadhyay, D. Soni, Khem Singh and P. K. Singh, MAPAN-Journal of Metrology Society of India (2021) 36(1):129–13
2. Key comparison: CCQM-K120-Carbon dioxide at background and urban level, Edgar Flores, et.al., Metrologia, (2019) 56 (1A).
3. International Comparison APMP.QM-S7.1: Methane in nitrogen at 2000 $\mu\text{mol/mol}$, BM Kim, HK Bae, K Hong, SI Lee, J Tshilingo, D Mogale, P Seemane, T Mphamo, N Ntsasa, HA Kadir, MF Ahmad, NHA Nasir, N Baharom, D Soni, Khem Singh, S Bhat, SG Aggarwal, P Johri, 2019.
4. International Comparison APMP.QM-S15: Comparison of measurement capability with 1000 $\mu\text{mol/mol}$ of Carbon dioxide in nitrogen, Final draft, J Lee, et.al., September 2019.
5. International Comparison APMP.QM-S9.2017: Comparison of measurement capability with 100 $\mu\text{mol/mol}$ of Carbon monoxide in nitrogen, Final draft, J Lee, et.al., September, 2019.
6. International Comparison APMP.QM-S13: Nitrous oxide in nitrogen(1000 $\mu\text{mol/mol}$), Final draft, Hai Wu, et.al., 2019
7. Traceability Issue in PM_{2.5} and PM₁₀ Measurements S. G. Aggarwal, S. Kumar, P. Mandal, B. Sarangi, Khem. Singh, J. Pokhariyal, S. K. Mishra, S. Agarwal, D. Sinha, S. Singh, C. Sharma and P. K. Gupta, MAPAN-Journal of Metrology Society of India, 28 (2013) 153–166.
8. Evaluation of purity with its uncertainty value in high purity lead stick by conventional and electro-gravimetric methods, Nahar Singh, Niranjan Singh, S S Tripathy, Daya Soni, Khem Singh, Prabhat K Gupta, Chemistry Central Journal.
9. Mass-size distribution of PM₁₀ and its characterization of ionic species in fine (PM_{2.5}) and coarse (PM_{10-2.5}) mode, New Delhi, India, Khem Singh, Suresh Tiwari Arvind K. Jha Shankar G. Aggarwal Deewan Singh Bisht, B. Padmanabhamurty, Z. H. Khan, Prabhat K. Gupta, Natural Hazards, 68 (2013) 775-789.
10. Chemical characteristics of aerosols and trace gas distribution over North and Central India, Khem Singh, D. P. Singh, C. K. Dixit, Nahar Singh, C. Sharma, S. Sahai, Z. H. Khan, Prabhat K. Gupta, Environ Monit Assess, 184 (2012) 4553-4564.
11. Dicarboxylic acids and water-soluble organic carbon in aerosols in New Delhi, India, in winter: Characteristics and formation processes, Yuzo Miyazaki, Shankar G. Aggarwal, Khem Singh, Prabhat K. Gupta, and Kimitaka Kawamura¹, Journal of Geophysical Research, 114, D19206, (2009) Doi:10.1029/2009jd011790.

Patents

A method for number count efficiency checks of particulate counter based on corresponding particle mass collected in parallel, Indian Patent, No. 2336DEL2015, Date: 03.02.2017

Particulate matter sampler, US Patent, No. US 10782212 B2, Date: 22.09.2020

A mask testing setup, Indian Patent, No. 202111045226, Date: 05.10.2021

Tangential six-inlet co-cylindrical cyclone for PM10 sampling, Indian Patent, No. 202111014940, Date: 31.03.2021

Current Activities

(Not more than 100 words)

Preparation of Primary Reference Gas Mixtures (PRGMs i.e. Gas BNDs) for greenhouse gases, pollution gases, energy and emission gases, particulate matter standard. Participation in international inter-comparisons and to organise proficiency testing programme. Dissemination of traceability to SI unit 'mole' through PRGMs. Calibration of particulate matter samplers, devices/sensors and related testing and project jobs. Impurity analysis in matrix gases to be used for gas mixture preparation.

Organising workshop, training, awareness and skill development programs.

Honour(s)/Award(s)/ Fellowship(s)

1. **CSIR-NPL Technology Licensed award 2017** for successful transferring the technology of High-Volume PM_{2.5} Impactor Sampler to an industry.
2. **CSIR-NPL Product Development award 2017** for developing Certified Reference Material of Bituminous Coal, BND5101A in collaboration with CSIR-CIMFR, Dhanbad.
3. **CITAC best paper Award for the year 2013** entitle "Traceability Issue in PM_{2.5} and PM₁₀ Measurements", S.G. Aggarwal, S. Kumar, P. Mandal, B. Sarangi, Khem Singh, J. Pokhariyal, S.K. Mishra, S. Agarwal, D. Sinha, S. Singh, C. Sharma & P.K. Gupta.
4. **TICA Fellowship was awarded 2009** by The Royal Thai Government, Thailand for participating in "The Third Country Training Programme on Strengthening of Measurement Standards Institutes of Asia Pacific Countries" in the field of pH standard, 2009.
5. **P.G Merit Scholarship in M.Sc. (Physics) in the year 1995-97** awarded by Aligarh Muslim University, Aligarh, India

Contributions to AcSIR

Nil

Membership of Professional Societies/ Institutions

1. Life member of Indian Association for Air Pollution Control (IAAPC)
2. Life member of Indian Society of Analytical Scientists (ISAS)
3. Life member of Metrology Society of India (MSI)

4. Life member of India Aerosol Science & Technology Association (IASTA)
5. Life member of Swadeshi Science Movement of India, Delhi (SSMD)

Any other Information

(Not more than 100 words)

- ✚ NABL Assessor for ISO/IEC 17025:2017
- ✚ Introduction to Measurement Uncertainty, Understanding Uncertainty Budgets and Metrology for Biogas course from NPL-UK in 2020
- ✚ Visited Germany, Thailand and Malaysia on deputation
- ✚ Attended international and national training programme on Gas Metrology and Particulate matter and trace gas analysis
- ✚ Reviewer to various International Journals: AAQR, JESCC, EES, Pollution, etc.
- ✚ Published 2 nos of Chapters in Book (Uncertainty reduction in green house inventory estimates, Universities Press, June 2004)
- ✚ Participated in various Major Land Campaigns for ambient air quality and mixing height studies like; ICARB, NATCOM, ISRO-GBP etc.
- ✚ Participated in International intercomparison like; APMP.QM-S7.1, APMP QM S13, APMP.QM-S15, CCQM K-76, Euramet project 1166, CCQM-K51, APMP QM S-9, CCQM K120a & 120b etc.