

Workshop on Reference Nanomaterials

Current situation and needs: development, measurement, standardization

jointly organized by BAM and PTB
May 14-15, 2018, PTB Berlin-Adlershof BESSY II

Day 1, May 14

Focus: reference material needs and development

Time	Title	Presenter	Organisation / Country code
10:30-11:00	Registration		
11:00-11:15	Welcome and Introduction		BAM/PTB, DE
11:15-11:45	Needs for certified and non-certified reference materials and representative test materials in the area of nanotechnology - Analysis of a survey held by JRC in 2017	H. Rauscher	JRC, IT
11:45-12:15	Expectations, results and follow-up: industry perspective in developing a measurement strategy for nanomaterial	M. Reuter	VCI, DE
12:15-12:45	The NanoDefine decision framework and "NanoDefiner" e-Tool	H. Rauscher	JRC, IT
12:45-12:55	<i>Group Photo</i>		
12:55-13:45	<i>Lunch</i>		
13:45-15:00	Poster session I		
15:00-15:20	OECD Test Guideline on particle size & size distribution of Manufactured Nanomaterials	H. Bresch	BAM, DE
15:20-15:40	Health Issues of Micro- and Nanoscale High Aspect Ratio Materials (HARM): Need for Reference Materials and Testing Standards	A. Meyer-Plath	BAuA, DE
15:40-16:00	<i>Coffee break</i>		
16:00-16:20	Synthesis of size and shape controlled TiO ₂ nanoparticles: possible CRM's candidates for size, shape and functional properties	V. Maurino	University of Turin, IT
16:20-16:40	Traceable nanoparticle characterization using Small-Angle X-ray Scattering (SAXS)	M. Krumrey	PTB, DE
16:40-17:00	Challenges of synthesis and analysis of core-shell nanoparticles for reference materials	A. Thünemann	BAM, DE
17:10-18:30	Visit of the PTB laboratory at BESSY II		
18:45-20:45	<i>Get Together and Dinner – previous registration required</i>		

Session Chairs Morning: H. Bosse, PTB
Afternoon: D. Hodoroaba, BAM
Poster: T. Dziomba, PTB



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Day 2, May 15

Focus: reference material characterization and standardization

Time	Title	Presenter	Organisation / Country code
08:00-08:30	Registration		
08:30-09:00	ISO Standardization Activities on Reference Nanomaterials	M. Stintz	TU Dresden, DE
09:00-09:20	Standardisation of magnetic nanomaterials: Steps towards magnetic reference particles	U. Steinhoff	PTB, DE
09:20-09:40	TSEM: a traceable method for nanoparticle metrology	E. Buhr	PTB, DE
09:40-10:00	Measurands and method dependent reference values: can one global particle size reference value fit all?	V. A. Coleman	NMIA, AU
10:00-11:20	Poster session II and coffee break		
11:20-11:40	TiO ₂ Pigment Sizing: Constituent, Aggregates and Primary Particles	R. Theissmann	KRONOS Int'l Inc., DE
11:40-12:00	Shape controlled TiO ₂ nanoparticles as candidates for nano-CRM's – an ISO case study	D. Hodoroaba	BAM, DE
12:00-12:20	Reference methods for the determination of the nanoparticle mass- and number-based concentration using hyphenated ICP-MS	D. Bartczak	LGC Limited, UK
12:20-12:40	Can labelled nanoparticles as internal standards improve the reliability of the quantitative analysis of nanomaterials in complex matrices?	S. Weigel	BfR, DE
12:40-13:00	Final discussion and end of the workshop		

Session Chairs Early morning: M. Krumrey, PTB
 Late morning: E. Buhr; PTB
 Poster: T. Dziomba, PTB



Workshop on Reference Nanomaterials

Poster Session I, May 14

Topic	Poster Title, May 14
CLN-01	The Malta Project – A European Initiative to Develop and Amend OECD Technical Guidelines for Testing of Nanomaterials E. Heunisch, V. Bachmann, T. Kuhlbusch / BAuA, DE
HSN-01	Quantification of Silver Nanoparticles at Single Cell Level by Mass Cytometry N. Jakubowski, A. Lopez-Serrano Oliver, A. Peddinghaus, D. Wittke, A. Haase, A. Luch, A. Grützkau, S. Baumgart BAM, DE; DRFZ, German Rheumatism Research Centre Berlin, DE; BfR, DE
HSN-02	OECD Test Guidelines Development for Chemicals Safety Assessment of Nanomaterials K. Schwirn, D. Völker, J. Ahtiainen, A. Schmidt, H. Bresch, K. Kämpf, V. Bachmann, T. Kuhlbusch UBA, DE; Drumsö Ecotox Consultancy, FI; BAM, DE; BAuA, DE
HSN-03	Assessing potential risks of nanomaterials - Genotoxicity screening with the fluorometric γ-H2AX assay and automated microscopic detection M. Wegmann, T. Jochum, M. Hannemann, V. Somma, K. Hoffmann, J. Niehaus, D. Roggenbuck, and U. Resch-Genger BAM, DE; Fraunhofer IAP, DE; MEDIPAN GMBH, DE
MAN-01	Reference samples for Magnetic Force Microscopy S. Sievers, H.W. Schumacher / PTB, DE
NCM-01	Nanocrystals as labeling reagents for Imaging Mass Cytometry J. Saatz, B. Grunert, N. Jakubowski / BAM, DE; nanoPET, DE
NCM-02	Studying nanoparticle-cell interaction by ICP-MS based techniques H. Traub, T. Büchner, D. Drescher, V. Merk, J. Kneipp, N. Jakubowski BAM, DE; Humboldt University Berlin, DE
RMN-01	Toward a reference sample for atom probe tomography M. Dialameh, C. Fleischmann, J. Bogdanwicz, N. De Leo, L. Boarino, W. Vandervorst / Imec, BE; Politecnico di Torino, IT; INRIM, IT; KU Leuven, BE
RMN-02	Creating the Silver Standard: Development and Applications of a Silver Nanoparticle Reference Material C. Kästner, H. Sieg, L. Böhmert, A. Lampen, A. F. Thünemann / BAM, DE; BfR, DE
RMN-03	Microwave-assisted high-speed silver nanoparticle synthesis P. E. J. Saloga, C. Kästner, A. F. Thünemann / BAM, DE
SDN-01	Development of a hybrid metrology combining AFM and SEM techniques for measuring the characteristic dimensions of a nanoparticle population L. Crouzier, A. Delvallée, N. Feltin, S. Ducourtieux, L. Devoille, G. Noircler, C. Ulysse, O. Taché, E. Barruet LNE, FR; Institut P' D1, FR; Centre de Nanosciences et de Nanotechnologies C2N, FR; CEA Saclay, FR

Topics Poster Session I, May 14

CLN: Classification of NM

HSN: Health & Safety of NM

MAN: Magnetic properties of NM

RMN: RM and Need

SDN: Size and size distribution of NM

SSN: Shape & (core-shell) structure of NM

NCM: NM in complex matrices



Workshop on Reference Nanomaterials Poster Session I, May 14

Topic	Poster Title, May 14 continued
SDN-02	Contribution to accurate Spherical Gold Nanoparticles analysis (size, size distribution) by SpICPMS and SAXS V. Geertsen, O. Taché, E. Barruet, J.L. Lacour, F. Gobeaux, A. Thil NIMBE / CEA Paris-Saclay, FR
SDN-03	Improved traceability chain of nanoparticle size measurements – the new EMPIR project nPSize V.-D. Hodoroaba, H. Bosse / BAM, DE; PTB, DE
SDN-04	Advanced screening method using volume-specific surface area (VSSA) for nanomaterial identification of powders P. Kuchenbecker, D.-V. Hodoroaba, W. Wohlleben, F. Lindemann BAM, DE; BASF; DE
SDN-05	Controlled electrospray deposition of nanoparticles for improved analysis by electron microscopy J. Mielke, P. Dohányosová, P. Müller, S. López-Vidal, V.-D. Hodoroaba BAM, DE; RAMEM S.A., ES; BASF SE, DE
SDN-06	Software development and instrument development for characterization of nano (C) RMs B.R. Pauw, I. Bressler, T. Snow, A. Thünemann / BAM, DE
SDN-07	Dimensional characterization of monodisperse sub 6 nm colloidal semiconductor nanocrystals J. C. Porsiel, A. Schirmacher, E. Buhr, G. Garnweitner TU Braunschweig, DE; PTB, DE
SDN-08	In-Situ SAXS Techniques Q. Saadeh, B.R. Pauw, A.F. Thünemann, J. Günster / BAM, DE
SDN-09	Measurements of biological particles and nanocharacterization methods C. Sousa, I. M. Pinto, D. Y. Petrovykh / INL, PT
SSN-01	Chemical Analysis of Core-Shell Nanoparticles using ToF-SIMS and XPS T. Heinrich, A. Müller, M. Schneider, K. Sparnacci, W.E.S. Unger BAM, DE; Università del Piemonte, IT
SSN-02	Synthesis and systematic characterization of core-multi-shell NaYF₄:Er³⁺, Yb³⁺@SiO₂@Au nanoparticles for the enhancement of fluorescence emissions M. Saleh, C. Kembuan, F. Frenzel, B. Rühle, C. Würth, C. Graf, U. Resch-Genger BAM, DE; Freie Universität Berlin, DE; Hochschule Darmstadt, DE
SSN-03	Characterization of core-shell quantum dots of different particle architecture on the ensemble and single particle level F. Weigert, U. Resch-Genger / BAM, DE

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Workshop on Reference Nanomaterials Poster Session II, May 15

Topic	Poster Title, May 15
DNS-01	SI traceable characterization of nanoscaled materials by X-ray spectrometry B. Beckhoff, P. Hönicke, Y. Kayser, B. Pollakowski-Herrmann, C. Seim, C. Streeck, R. Unterumsberger / PTB, DE
DNS-02	Analytical and topographical Reference Material for the Nanoscale I. Busch, S. Bütetisch, O. Lenck, L. Koenders, W. Unger, T. Weimann, M. Weinert / PTB, DE; BAM, DE
DNS-03	Directed self-assembly of Block Copolymers for Lateral Length Standards at the Nanoscale F. Ferrarese Lupi, G. Aprile, E. Cara, M. Dialameh, N. De Leo, L. Boarino Nano Facility Piemonte, IT; INRIM, IT
DNS-04	Reference-free GIXRF-XRR based qualification of nanolayers and nanostructures as potential calibration samples P. Hönicke, V. Soltwisch, Y. Kayser, B. Beckhoff, F. Scholze, T. Weimann, M. Krämer / PTB, DE; AXO DRESDEN, DE
DNS-05	OECD Test Guideline on Particle Size and Particle Size Distribution of Manufactured Nanomaterials: Simultaneous Measurement of Length and Diameter of Fibers K. Kämpf, V. Bachmann, H. Bresch, A. Schmidt, T. Kuhlbusch, K. Schwirn, D. Völker / BAuA, DE; BAM, DE; UBA, DE
DNS-06	PillarHall LHAR structure for thin film conformality measurements V. Korpelainen, O. M. E. Ylivaara, M. Ylilampi, M. Utriainen, Feng Gao and R. L. Puurunen / VTT, FI; Aalto University, FI
DNS-07	Traceable 3D nanometrology V. Korpelainen, M. Valtr, G. Zeng, A. Yacoot, N. Sebaihi, G. Dai, R. Koops, T. Hausotte, Yiting Wu, G. Papageorgioui and P. Dimitrakisi, H. Spruit, E. van Zeijl, G.B. Picotto and F. Meli VTT, FI; CMI, CZ; DFM, DK; NPL, UK; PTB, DE; SMD, BE; VSL, NL; FAU, DE, NCSR Demo- kritos, GR; TNO, NL; INRIM, IT; METAS, CH
DNS-08	The need of a reference for APT-AFM tip reconstruction J. Op de Beeck, C. Fleischmann, K. Paredis, W. Vandervorst IMEC, BE; KU Leuven, BE
DNS-09	The Research of Nanometer Geometry Standard Reference Materials in NIM Y. Shi, S. Zhang, S. Gao, X. Hu, S. Li, W. Li, Q. Li, L. Huang / NIM, CN
MPN-01	Nanoscale reference artefacts for contact resonance spectroscopy and force-distance curve techniques M. Fahrbach, M. Bertke, G. Hamdana, L. Krieg, T. Voss, B. Cappella, E. Peiner TU Braunschweig, DE; BAM, DE

Topics Poster Session II, May 15

DNS: Dimensional nanostandards

OPN: Optical properties of NM

MPN: Mechanical properties of NM



Workshop on Reference Nanomaterials

Poster Session II, May 15

Topic	Poster Title, May 15 continued
MPN-02	Development of a Method for Measuring the Rigidity of Nanofibers R. Fortini, D. Kehren, A. Meyer-Plath, H. Sturm / BAM, DE; BAuA, DE
MPN-03	Crystalline Si and GaN micro- and nanopillars as reference artefacts for nano-mechanical characterization P. Puranto, J. Langfahl-Klabes, G. Hamdana, M. Bertke, M. F. Fatahilah, Feng Yu, A. Felgner, Min Xu, F. Pohlenz, T. Granz, E. Peiner, A. Waag, H. S. Wasisto, Z. Li, U. Brand PTB, DE; TU Braunschweig, DE; Indonesian Institute of Sciences (LIPI), ID
OPN-01	Long-range ordered gold-coated silicon nanowires for surface-enhanced Raman spectroscopy E. Cara, F. Ferrarese Lupi, L. Mandrile, A. Giovannozzi, M. Dialameh, N. De Leo, L. Boarino / INRIM, IT
OPN-02	Synthesis and optical characterization of ternary AlS/ZnS quantum dots L. Dharmo, J. X. Soares, U. Resch-Genger / BAM, DE; University of Porto, PT
OPN-03	Sandwich assay of Magnetic and Gold Nanoparticles for Purification and Quantification of Tau-Protein using ID-SERS C. Frank, V. Maurer, J. C. Porsiel, S. Zellmer, S. Wundrack PTB, DE; TU Braunschweig, DE
OPN-04	Raman spectroscopy for identification and quantification of different polymorphic forms of titanium dioxide in nanoparticle mixtures L. Mandrile, C. Portesi, A.M. Rossi / INRIM, IT
OPN-05	Optical characterization of Cd-free AgInS/ZnS quantum dots I. Martynenko, J. Soares, J. Pauli, U. Resch-Genger / BAM, DE
OPN-06	Simple and Validated Methods for Quantifying Functional Groups, Ligands, and Biomolecules on Nanomaterials N. Nirmalanathan, M. Moser, D. Geissler, T. Behnke, R. Schneider, U. Resch-Genger / BAM, DE
OPN-07	Functional group analysis on nanoparticles with simple optical assays N. Nirmalanathan, M. Moser, T. Behnke, D. Geißler, U. Resch-Genger/BAM,DE
OPN-08	The Future of Scattering for Nanomaterial Characterisation B.R. Pauw, A.Thünemann / BAM, DE
OPN-09	Investigation of upconverting nanoparticle growth utilizing in-situ luminescence monitoring in combination with offline small-angle X-ray scattering (SAXS) and transmission electron microscopy (TEM) S. Radunz, A. Schavkan, S. Wahl, C. Würth, H. R. Tschiche, U. Resch-Genger BAM, DE; PTB, DE; Humboldt University Berlin, DE

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DNS: Dimensional nanostandards

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