

EU 7th FRAMEWORK PROGRAMME

**Theme 4: Nanosciences, Nanotechnologies, Materials and
new Production Technologies**

and

Theme 6: Environment (including Climate Change)



NanoValid

**Development of reference methods for hazard
identification, risk assessment and LCA of en-
gineered nanomaterials**

NMP4-SL-2011-263147

**Deliverable title: Certification Reports on Prototype
ENP CRMs as developed by partners**

&

**Certification Reports on ENP CRMs as developed by
partners**

Deliverable number: 5.41 & 5.42

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Lead beneficiary: 17

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1 Abbreviations and acronyms

ENM	Engineered NanoMaterials
ENP	Engineered NanoParticles
T-SEM	Scanning Electron Microscopy in Transmission mode
SEM	Scanning Electron Microscopy
TEM	Transmission Electron Microscopy
EU	European Union
OECD	Organization for Economic Cooperation and Development
WP	Work Package
BAM	Bundesanstalt für Materialforschung und –prüfung
CRM	Certified Reference Material
nAu	Gold nanoparticles
nAg	Silver nanoparticles
pc	physico-chemical

Summary

A survey on the candidate nanomaterials developed under NanoValid is given. Each prototype is introduced by using the NanoValid ENP Specification Form. Evaluation results are presented. The BAM TiO₂ and the INMETRO nAu CRM (NNV-004) certification data are summarized. Another BAM CRM, nAg (BAM-N001), is introduced. This BAM CRM was available for NanoValid partners (and the public) through the BAM website. Candidate nanomaterials already used for (eco)toxicological testing under WP2, 3 and 5 and information on their performance are being collated in a new table. Two of the potential candidate materials are being made available as class [H2](#) reference materials. These are NLAB silica (NNV-001) and BAM silica.

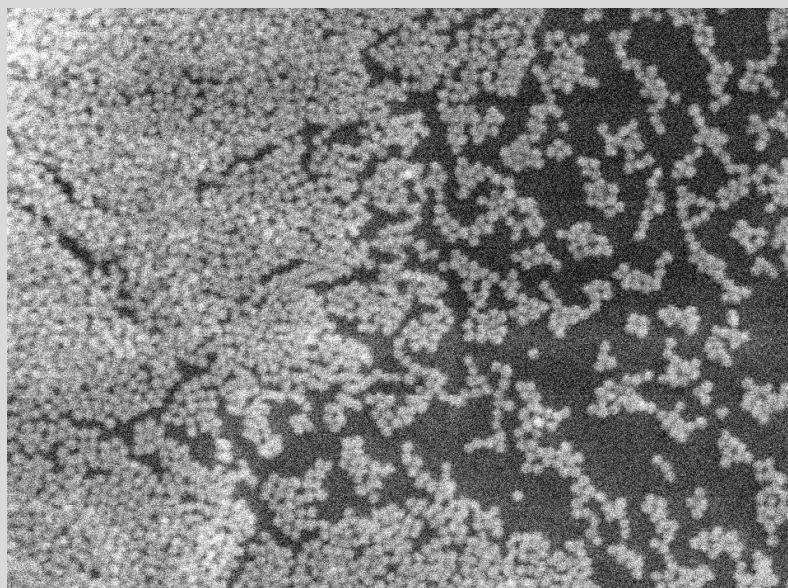
Annex 1

#14 BAM Silica

Material	Silica nanoparticles Data from BAM and TEM pictures (*) by courtesy of Guillermo Orts-Gil, Kishore Natte and Werner Österle, see also Ref: G. Orts-Gil et al., Colloids and Surfaces B: Biointerfaces 108 (2013) 110-119
Batch descriptor	Lys-SNPs-B1
Provider	BAM
1. ENP delivered as powder	no
Mean primary particle size (< 100 nm!)	
Particle size distribution information	
Particle shape information	
Composition, Purity	
Information on coating	
BET surface	
2. ENP delivered as suspension	yes
Mean primary particle size (< 100 nm!)	T-SEM: close to 15 nm (see Figs. T-SEM, TEM*)
Particle size distribution information	TEM*, T-SEM: relative narrow size distribution

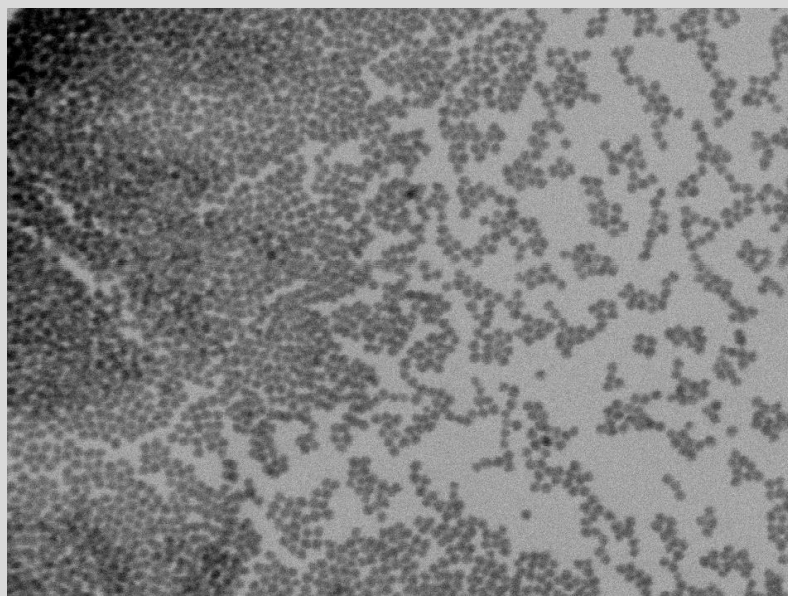
Particle shape information	TEM*, T-SEM: relatively close to spherical		
Particle concentration	0.5 % w/w		
Composition	XPS (see Fig. XPS)		
	Peak assign-ment	Pos./ eV	Fraction/ At%
	O1s	531	60
	C1s	284	8
	Si2p	102	32
Composition of liquid matrix	H ₂ O		
Purity of liquid matrix			
Information on coating			
Information on stabilizers			
Stability			
pH value (recommended to be between within 5.5 to 8)	~ 5		
Surface charge (zeta potential or PZC)	- 22 mv		
3. Representative pictures, etc.			

Representative picture
(TEM, SEM, etc.)



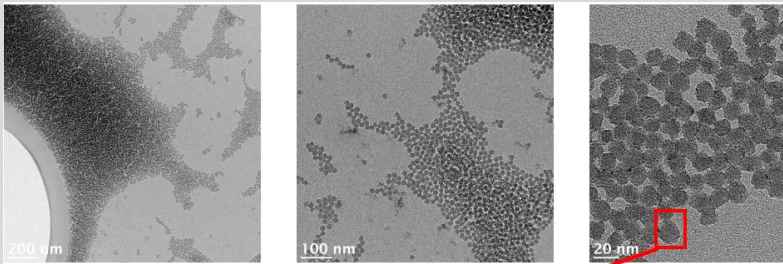
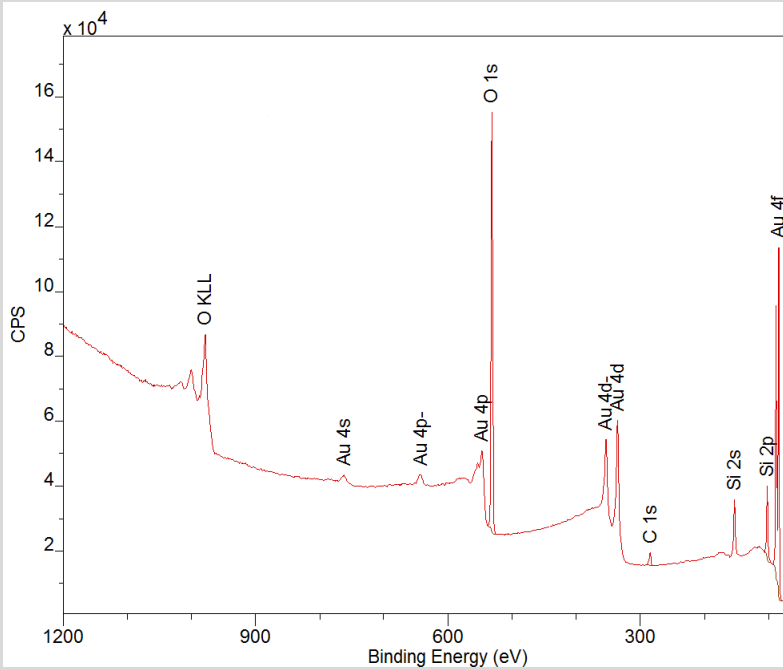
BAM Oberflächenanalytik und Grenzflächenchemie File Name = 1202040.tif EHT = 20.00 kV Signal A = InLens 100 nm Date :3 May 2012 WD = 2.7 mm Mag = 350.00 K X

In-Lens SEM of Lys-SNPs-B1 silica.



BAM Oberflächenanalytik und Grenzflächenchemie File Name = 1202039.tif EHT = 20.00 kV Signal A = SE2 100 nm Date :3 May 2012 WD = 2.7 mm Mag = 350.00 K X

T-SEM of Lys-SNPs-B1 silica.

	 <p>TEM* of Lys-SNPs-B1 silica.</p>
<p>Representative spectra (XPS, etc.)</p>	 <p>XP survey spectrum of Lys-SNPs-B1 (Gold and carbon photoemission peaks from the Au coated Si Wafer substrate).</p>
<p>Representative graphical data (DLS, XRD, etc.)</p>	