

ZincOxide Coated Silica NanospringsTM 1/5

MATERIAL DATA SHEET	
PHYSICAL INFORMATION	
MATERIAL:	ZincOxide coated silica Nanosprings TM
COLOR:	White to beige
COMPOSITION:	Conformal coating on SiO ₂ nanosprings TM . Nanosprings TM are form of multiple springs attached to a substrate
STRUCTURE:	Crystalline on amorphous silica Nanospring TM .
NANOSPRING TM MASS:	0.5±0.085 mg/cm ²
COATING MASS:	3.0±0.5 mg/cm ²
TOTAL MASS:	3.57±0.5 mg/cm ²
WIRE DIAMETER:	201.6±52nm
COIL DIAMETER:	279.7±49nm
COIL PITCH:	298.5±115nm
CRYSTAL SIZE:	23±8×50.7±16nm
NANOPARTICLE SIZE:	NA
MELTING POINT:	1000°C
MAXIMUM TEMPERATURE:	Substrate dependent, if below melting point
SUBSTRATE:	Al foils, SST, glass, glass frits, Si wafers, cordierite, fiberglass cloth

CHARACTERIZATION

fe-SEM

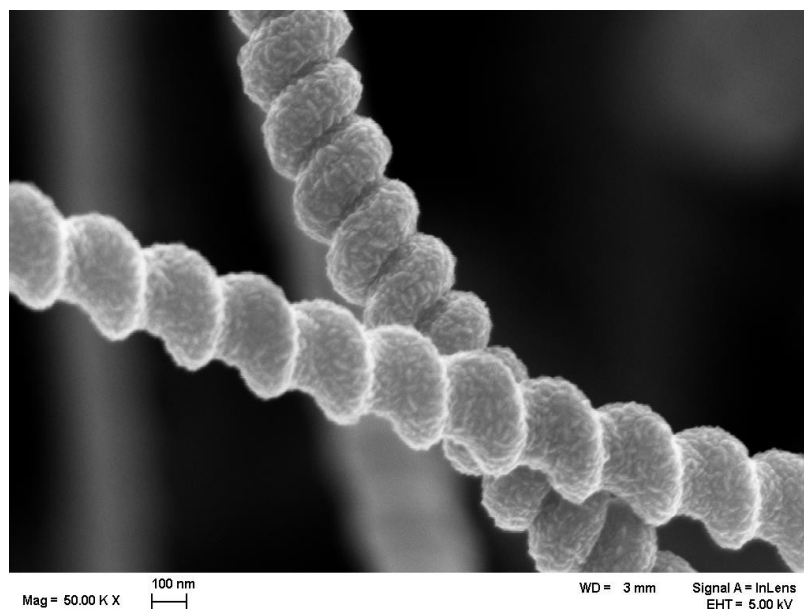


Figure 1: fe-SEM of ZnO coated silica NanospringsTM

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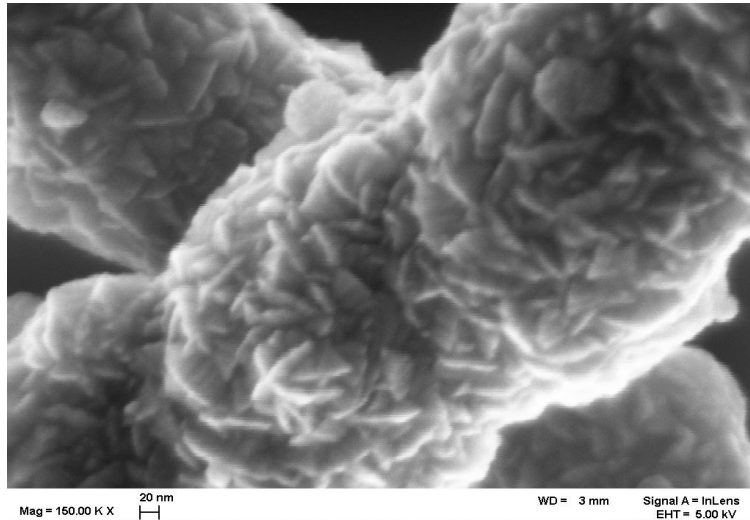


Figure 2: fe-SEM of ZnO coated silica NanospringsTM

TEM

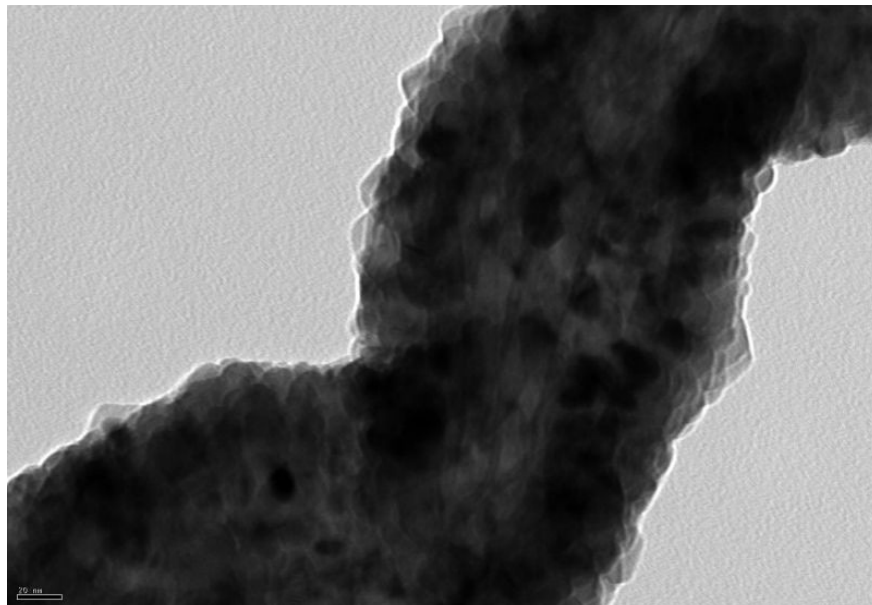


Figure 3: TEM of ZnO coated silica NanospringsTM. Scale bar is 20nm.

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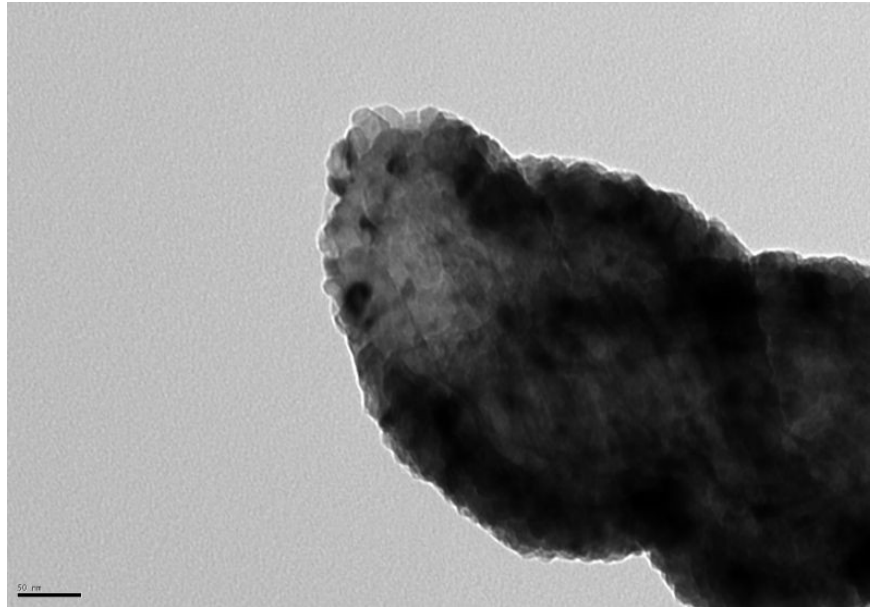
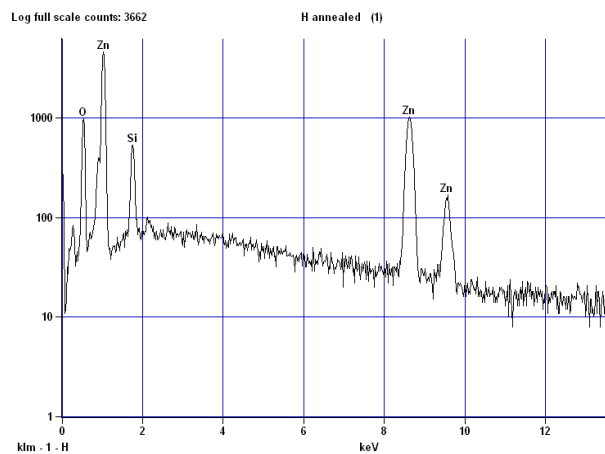


Figure 4: TEM of ZnO coated silica NanospringsTM. Scale bar is 50nm.

ELEMENTAL ANALYSIS

fe-SEM-EDS



Element Line	Net Counts	Net Counts Error	Weight %	Weight % Error	Atom %	Atom % Error
O K	5907	+/- 83	19.77	+/- 0.28	47.82	+/- 0.67
Si K	4385	+/- 97	5.98	+/- 0.13	8.24	+/- 0.18
Zn K	18147	+/- 267	74.25	+/- 1.09	43.94	+/- 0.65
Total			100.00		100.00	

Figure 5: SEM-EDS of ZnO coated silica NanospringsTM

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XRD

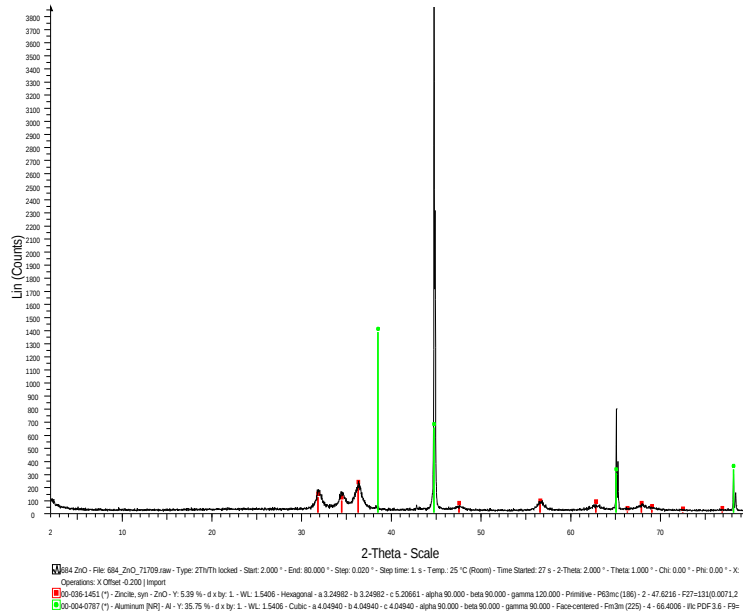


Figure 6: XRD spectra of a ZnO coated silica NanospringsTM.

Chemical Analysis

XPS

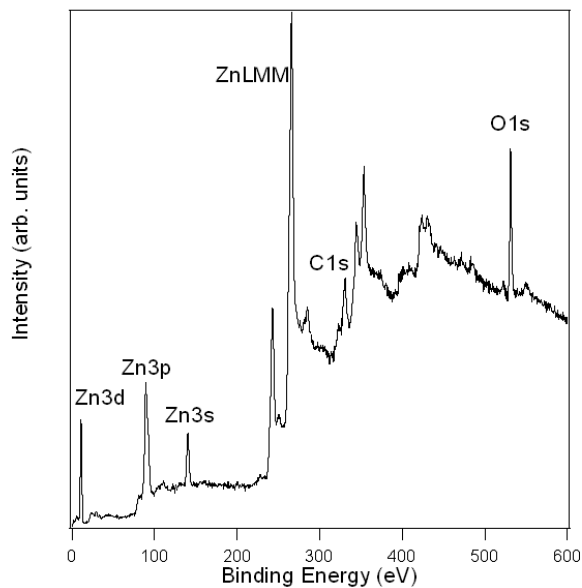


Figure 7: XPS wide scan of ZnO coated silica NanospringsTM.

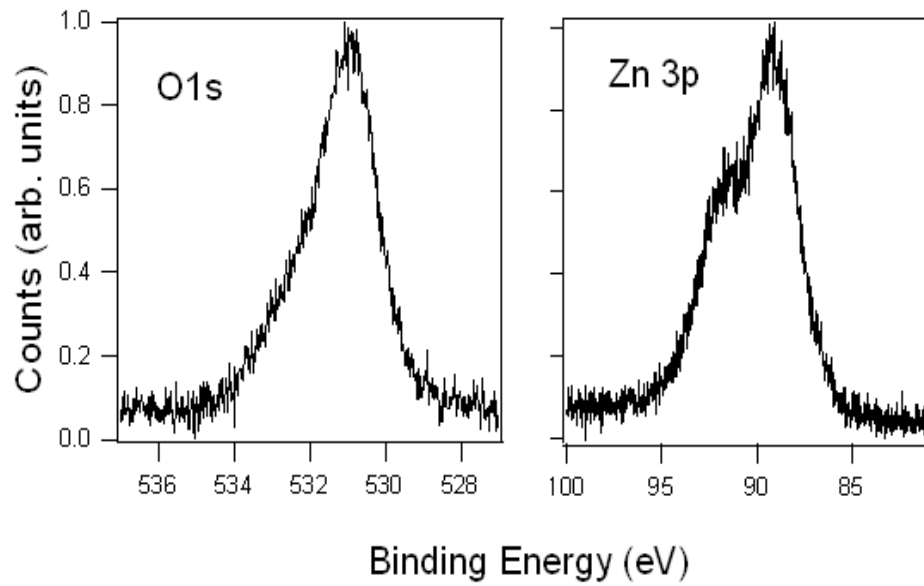


Figure 8: XPS spectra of the O 1s and Zn 3p core level states of ZnO coated silica Nanosprings[™].