Surface Characterization of Colloidal Silica Nanoparticles by Second Harmonic Scattering: Quantifying the Surface Potential and Interfacial Water Order

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Shorthand notations for independent tensor components

Table S1: Overview of the shorthand notation for independent tensor components used in this work.

Indexed component	Tensor component
$\chi_1^{(2)}$	$\chi_{\perp\perp\perp}^{(2)} - \chi_{\parallel\parallel\perp}^{(2)} - \chi_{\parallel\perp\parallel}^{(2)} - \chi_{\perp\parallel\parallel}^{(2)}$
$\chi_2^{(2)}$	$\chi_{\parallel\parallel\perp}^{(2)}$
$\chi_3^{(2)}$	$\chi_{\parallel\perp\parallel}^{(2)}$
$\chi_4^{(2)}$	$\chi_{\perp\parallel\parallel}^{(2)}$

Parameters used for surface potential fitting

Table S2: Parameters used for the AR-SHS fits of NaOH series

NaOH addition	pH 5.7	pH 10	pH 11
Radius (nm)	145	148	142
Second harmonic wavelength (nm)	515	515	515
Refractive index of the particle (silica)	1.46	1.46	1.46
Refractive index of the solvent (water)	1.33	1.33	1.33
Temperature (°C)	23	23	23
Number of particles (particles/ml)	$3.50 \cdot 10^{10}$	$3.50 \cdot 10^{10}$	$3.50 \cdot 10^{10}$
Concentration of ions (M)	$4.02 \cdot 10^{-6}$	0.0001	0.001

Table S3: Parameters used for the AR-SHS fits of NaCl series

NaCl addition	pH 10	pH 10 + 0.1mM NaCl	pH 10 + 1 mM NaCl	pH 10 + 10mM NaCl
Radius (nm)	147	146	142	143
Second harmonic wavelength (nm)	515	515	515	515
Refractive index of the particle (silica)	1.46	1.46	1.46	1.46
Refractive index of the solvent (water)	1.33	1.33	1.33	1.33
Temperature (°C)	23	23	23	23
Number of particles (particles/ml)	$3.50 \cdot 10^{10}$	$3.50 \cdot 10^{10}$	$3.50 \cdot 10^{10}$	$3.50 \cdot 10^{10}$
Concentration of ions (M)	$1 \cdot 10^{-4}$	$2 \cdot 10^{-4}$	0.0011	0.0101