

# Supplementary Information for “Structural origin of light emission in germanium quantum dots.”

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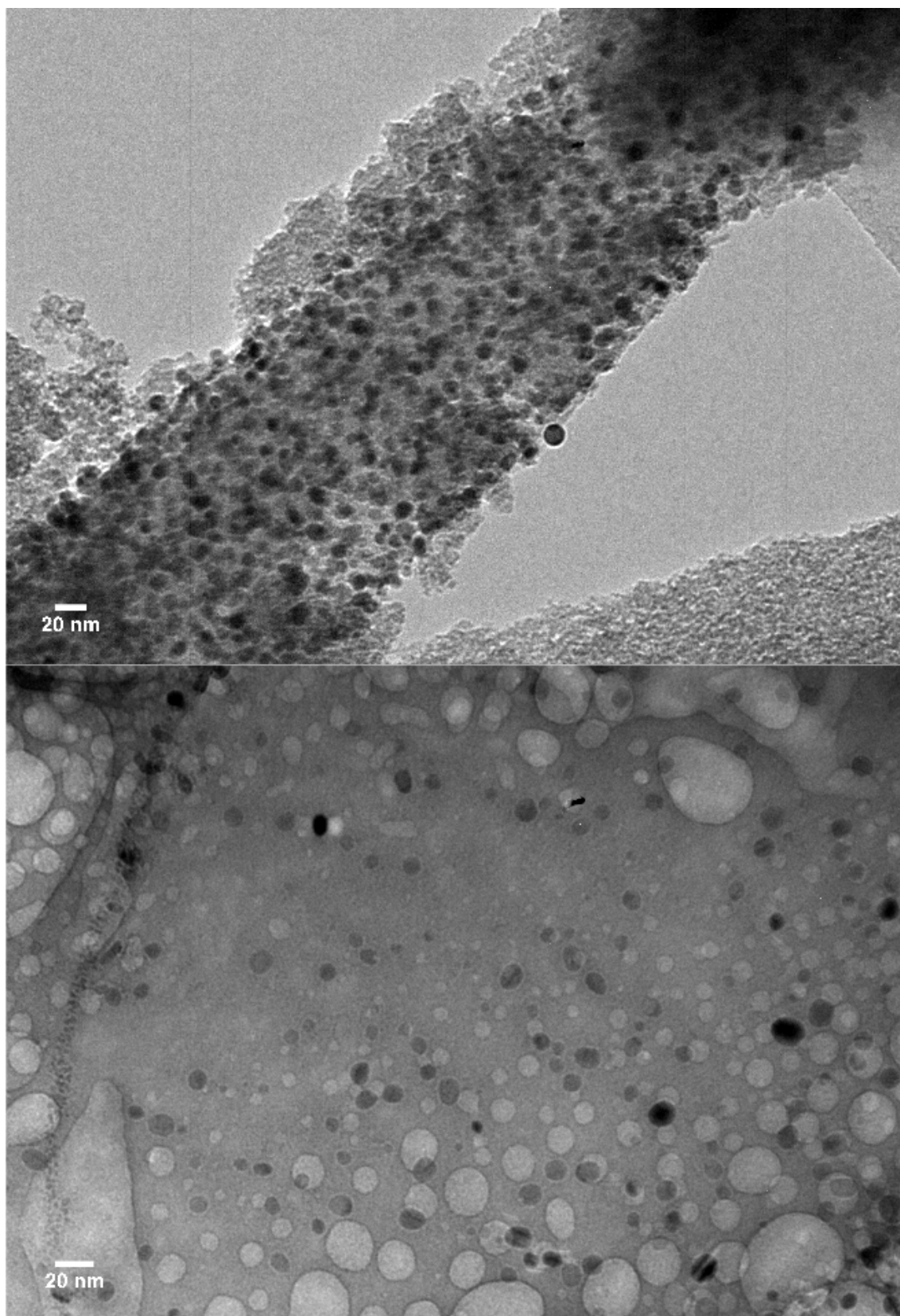
(Dated: October 17, 2014)

Fitting Parameters	EXAFS Refinement Parameters		
	Sol-gel	Etched (O)	Etched (H)
N1, set	4 (O)	4 (O)	4 (Ge)
R1, Å,	$1.724 \pm 0.005$	$1.744 \pm 0.006$	$2.450 \pm 0.009$
$S_0^2$	$0.868 \pm 0.089$	$0.625 \pm 0.102$	$0.518 \pm 0.093$
$\Delta E_0$ , eV	$3.545 \pm 1.468$	$2.332 \pm 0.487$	$2.281 \pm 3.196$
$\sigma^2$ , Å <sup>2</sup>	$0.0018 \pm 0.0008$	$0.0091 \pm 0.0002$	$0.0021 \pm 0.0004$
N2, set	4 (Ge)	4 (Ge)	12 (Ge)
R2, Å,	2.45 (set)	2.45 (set)	4.00 (set)
$\sigma^2$ , Å <sup>2</sup>	$0.002 \pm 0.002$	$0.001 \pm 0.0008$	$0.015 \pm 0.004$
N3, set	4 (Ge)	4 (Ge)	12 (Ge)
R3, Å,	$2.798 \pm 0.024$	$2.791 \pm 0.007$	4.69 (set)
$\sigma^2$ , Å <sup>2</sup>	$0.018 \pm 0.006$	$0.0013 \pm 0.002$	$0.018 \pm 0.005$

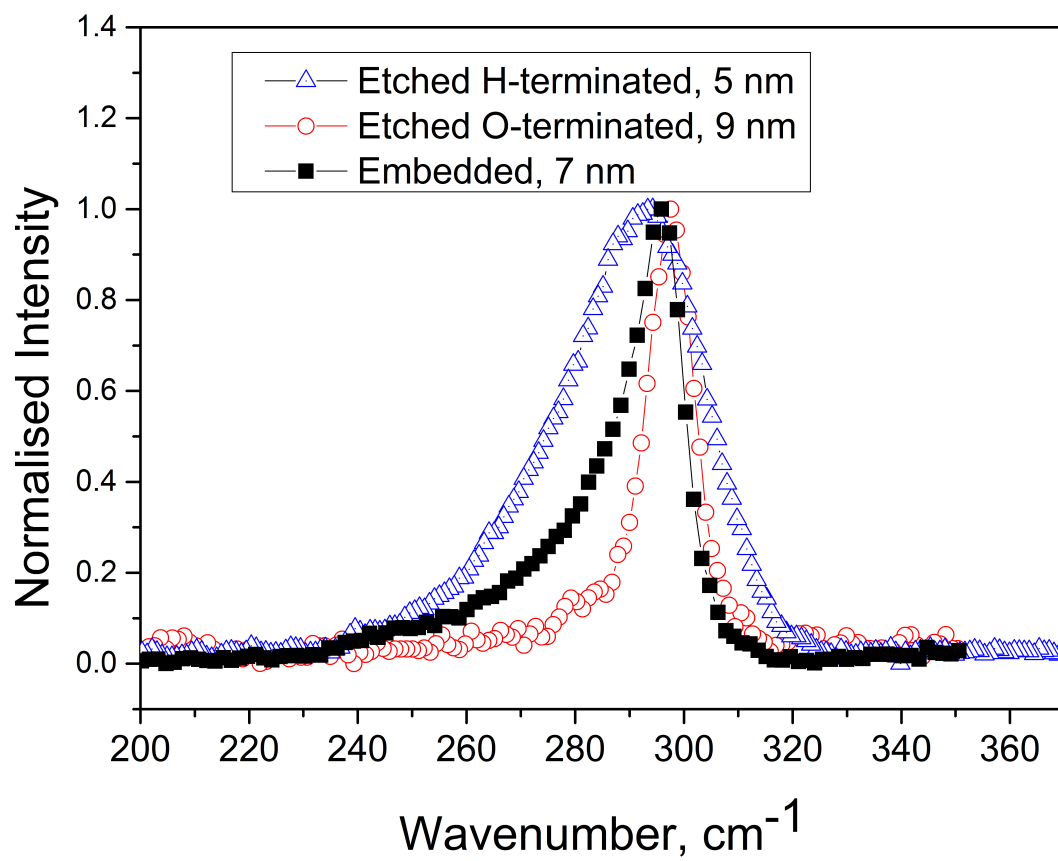
TABLE I: The fitting parameters for transmission EXAFS data including "set" (not refined) parameters. Nearest neighbours only.

Fitting Parameters	OD-EXAFS Refinement Parameters		
	Sol-gel	Etched (O)	Etched (H)
N, set	4 (O)	4 (O)	4 (Ge)
R1, Å,	$1.723 \pm 0.014$	$1.725 \pm 0.025$	$2.44 \pm 0.01$
$S_0^2$	$0.688 \pm 0.091$	$0.679 \pm 0.087$	$0.607 \pm 0.099$
$\Delta E_0$ , eV	$7.303 \pm 2.081$	$4.876 \pm 2.165$	$5.879 \pm 1.432$
$\sigma^2$ , Å <sup>2</sup>	$0.0022 \pm 0.012$	$0.0035 \pm 0.014$	$0.0044 \pm 0.0015$

TABLE II: The fitting parameters for OD-EXAFS data including "set" (not refined) parameters.



Supplementary figure S1: TEM data for Ge quantum dots. Top, Sol-gel sample. Bottom, Sample prepared by etching. Scale bar is 20 nm.



Supplementary figure S2: Raman for all Ge samples. Raman data for sol-gel samples and samples prepared by etching and corresponding average sample sizes.