Supporting Information

Sculpting silica colloids by etching particles with non-uniform compositions

Fabian Hagemans, Wessel Vlug, Chiara Raffaelli, Alfons van Blaaderen*, and Arnout Imhof**

Soft Condensed Matter, Debye Institute for NanoMaterials Science, Utrecht University, Princetonplein 1, 3584 CC, Utrecht, The Netherlands

**E-mail: f.hagemans@uu.nl, a.vanblaaderen@uu.nl, a.imhof@uu.nl*

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Temperature

Changing the temperature during the reaction resulted in the rod shaped particles with steps in diameter and degrees of silica crosslinking. These particles were synthesized in three different schemes as described in the experimental section. When the temperature is increased, the length of the segment also increases. Thus, with equal growth time a segment grown at higher temperatures will have an increased length. TEM (transmission electron microscopy) images of the resulting silica rods are shown in Figure SI1.

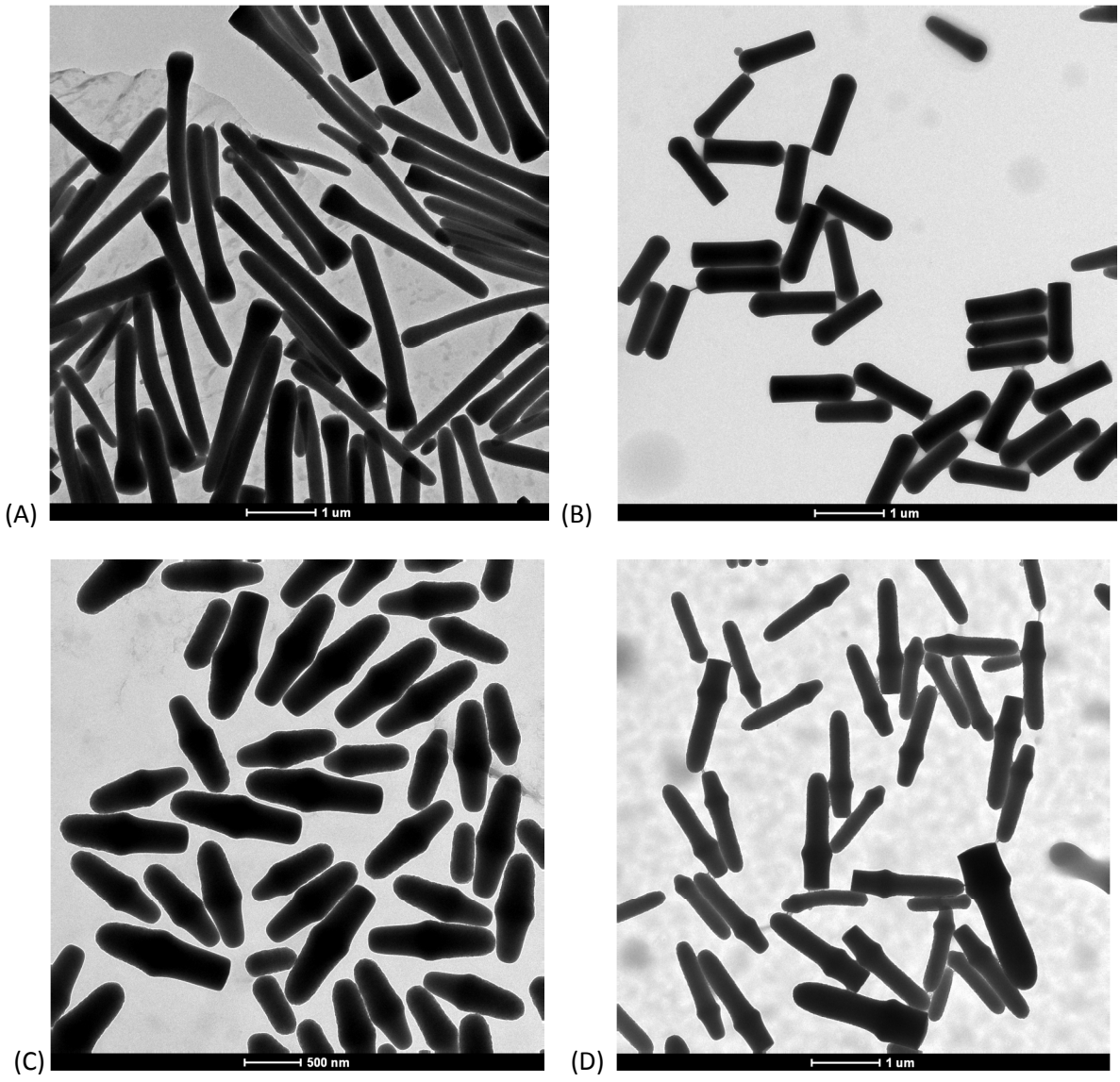
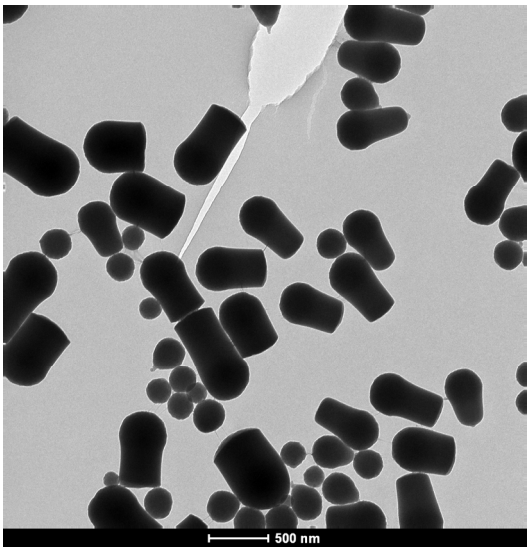


Figure SI1: TEM images of silica rods synthesized according to the procedure described in the experimental section. During this reaction the temperature was changed in four different sequences. (A) 50 ^{o}C for 2 hours, 5 ^{o}C for 22 hours (B) 5 ^{o}C for 2 hours, 25 ^{o}C for 22 hours (C) 50 ^{o}C for 0.5 hour, 5 ^{o}C for 4 hours, 25 ^{o}C for 22 hours and (D) 50 ^{o}C for 1 hour, 5 ^{o}C for 4 hours, 25 ^{o}C for 22 hours.

Ethanol delay time

The delayed addition of ethanol for either 1 hour or 3 hours resulted in rod-shaped particles as shown in Figure SI3.

(A) 

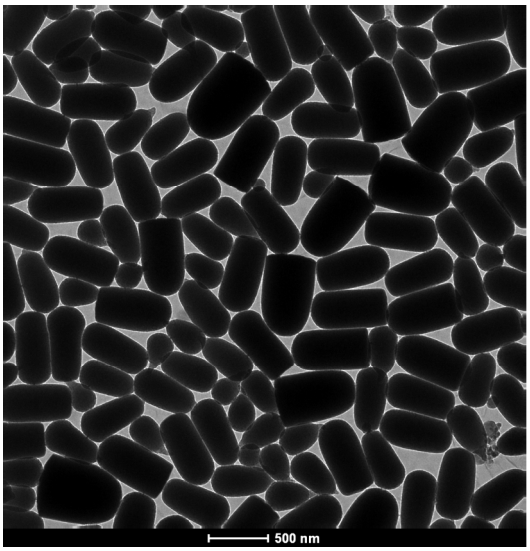
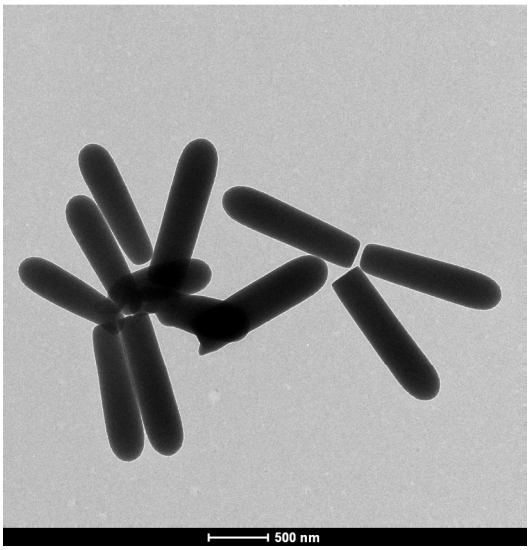
(B) 

Figure SI2: TEM image of silica rods where the addition of ethanol was delayed by either 3 hours (A) or 1 hour (B).

Segmented rods / spheres – amine functionality

The synthesis of segmented silica rods resulted in straight rod-shaped particles with a step in composition. The synthesis of silica spheres with a step in composition resulted in monodisperse silica spheres of 880 ± 26.3 nm and 23 % of dumbbells.

(A) 

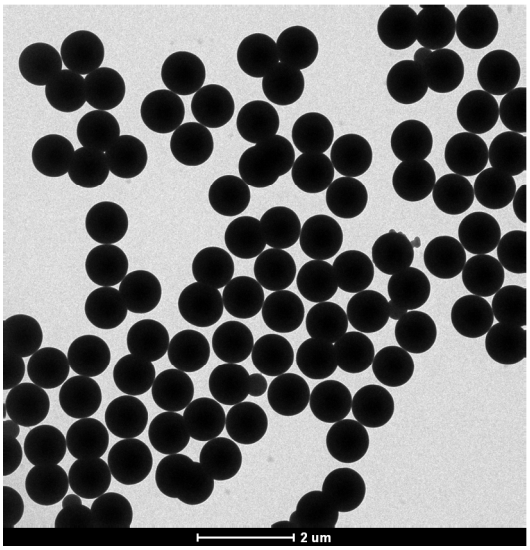
(B) 

Figure SI3: (A) Segmented silica rods, the second segment consist of a different composition (APTES, 3-aminopropyltriethoxysilane) than the first segment. (B) Segmented silica spheres, the particle consist of a core, a layer with a different composition (EDAP, N-[3-(Trimethoxysilyl)-propyl]ethylene-diamine) and finally a shell of pure silica.