Experimental Section:

Materials and measurements:

All materials and reagents were obtained from commercial suppliers for direct use unless mentioned. Terminal amino calix[6]crowns (TAC) was synthesized according to the procedure of our reference (Soft matter, 2008, 4, 1393). In order to form the hybrid nanotubes, tetraethoxysilane (TEOS) aqueous solution was injected into the solutions of TAC in ethanol reaching a volume ratio of water/ethanol was 1:1. TEM observations were performed on a Philips CM 120 electron microscope. A small drop from the solution was deposited onto carbon-coated coppers grid and then dried at room temperature. SEM experiments were taken on a Tescan 5136MM scanning electron microscope. The AFM images were acquired in tapping mode by using a Nanoscope IV from Digital Instruments equipped with a silicon cantilever with a 125 Pmand E-type vertical engage piezoelectric scanner. For SEM and AFM observations, the samples were prepared by drying the solution on freshly cleaved mica at room temprecture. FE-SEM-EDX was adopted an S-4800 scanning electron microscopy with a QUANTAX 400 energy dispersive X-ray spectrum as an accessory.

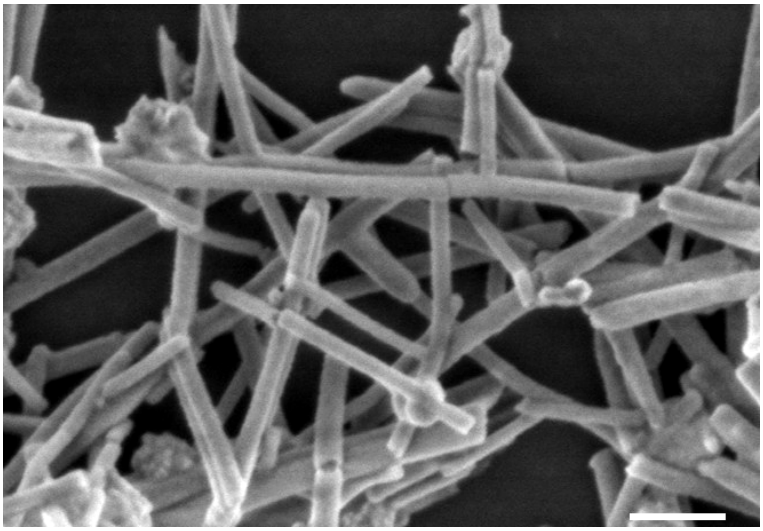

Figure S1 FE-SEM image of the hybrid nanotubes. The scale bar represents 200nm.

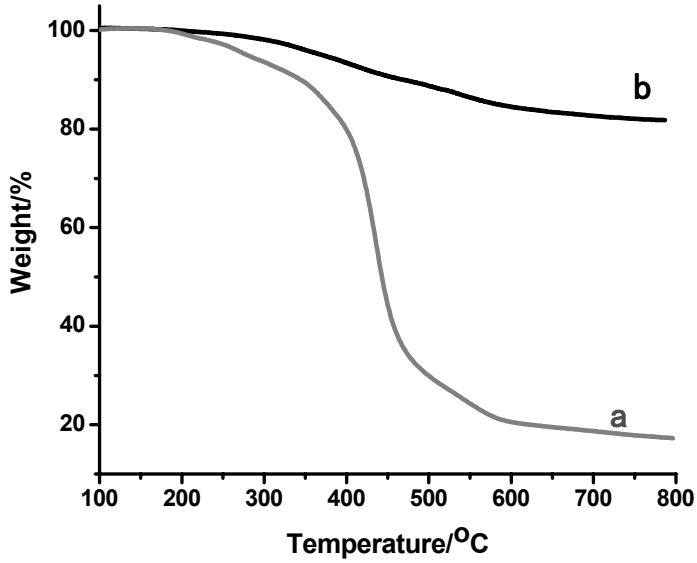

Figure S2 TGA analysis of organic TAC nanotubes line **a** (gray color) and hybrid nanotubes line **b** (black color). Temperature ramp at 20°C/min.

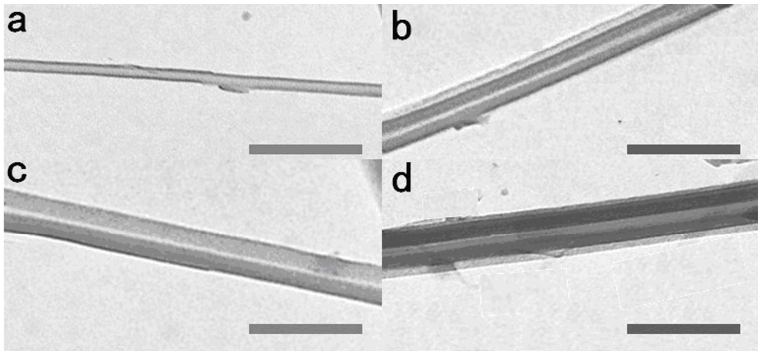

Figure S3 TEM images of the thickness of hybrid nanotubes in the different dosage of TEOS a) 5, b) 20, c) 40, d) 60 µl. The scale bar represents 200 nm.

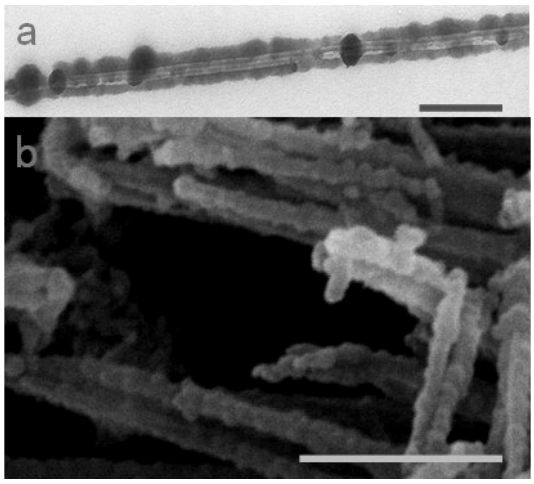

Figure S4 the TEM a) and SEM b) images of the aggregates calcined in 600 ^{o}C for 8 hours. TEM scale bar is 200nm. SEM scale bar is 1μm.

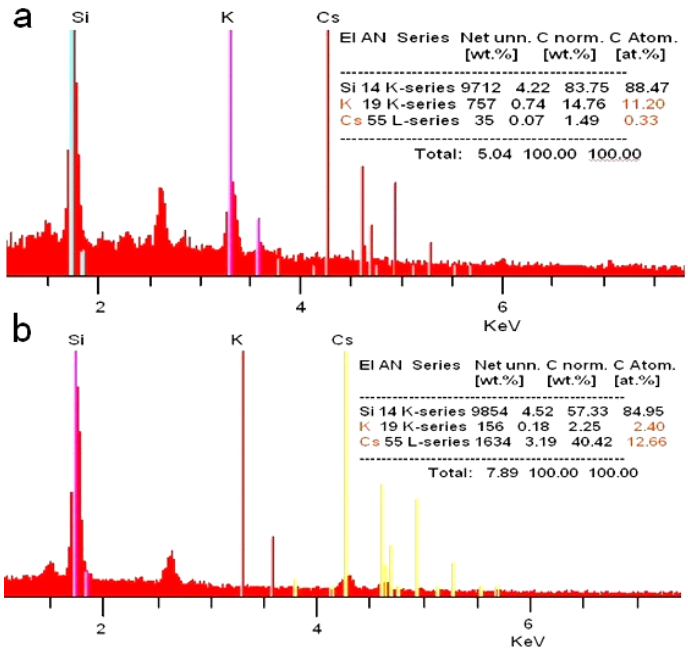

Figure S5 FESEM-EDX spectrum of the hybrid nanotubes incorporated K^{+} ions a) and replaced by Cs^{+} ions b).

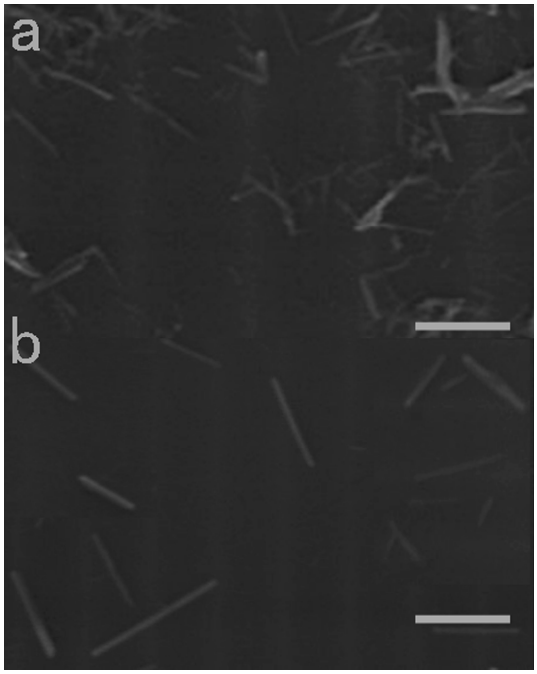

Figure S6 SEM images of the a) TAC nanotubes and the b) hybrid nanotubes after ultrasonication for 10 mins. The scale bar represents 1 μm.