

## Supporting information

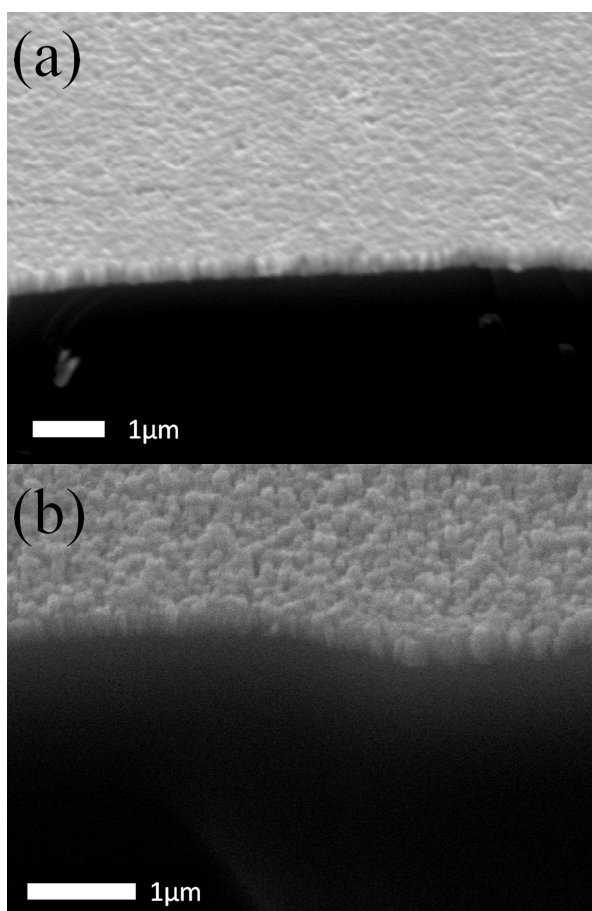


Figure S1: SEM Image of thin ZnO films deposited by CBD from (a) direct decomposition of zinc acetate at 65°C (b) zinc nitrate and HMT at 90°C

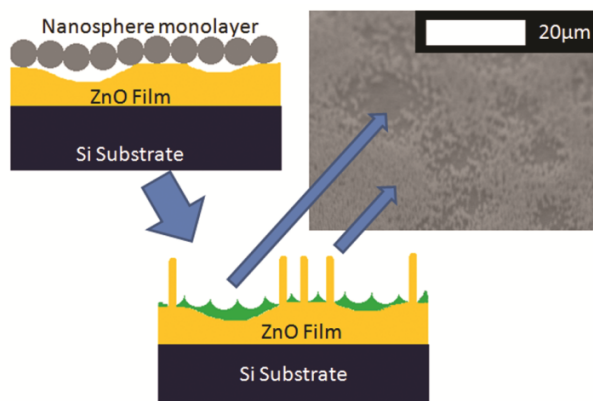


Figure S2: Schematic representation of the effects of poor surface contact between the nanosphere monolayer and the CBD ZnO buffer layer on the VPT deposition of ordered nanorod arrays (left and bottom) and an SEM image (right) showing the resulting VPT nanorod array with poor uniformity of nanorod coverage.

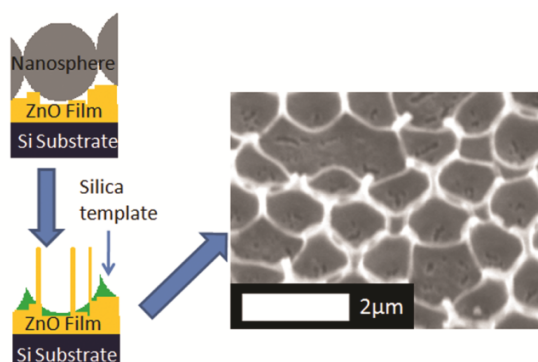


Figure S3: Schematic representation and SEM image of the effects of surface roughness on contact between the underlying CBD layer and the nanospheres and its effect on the silica template.

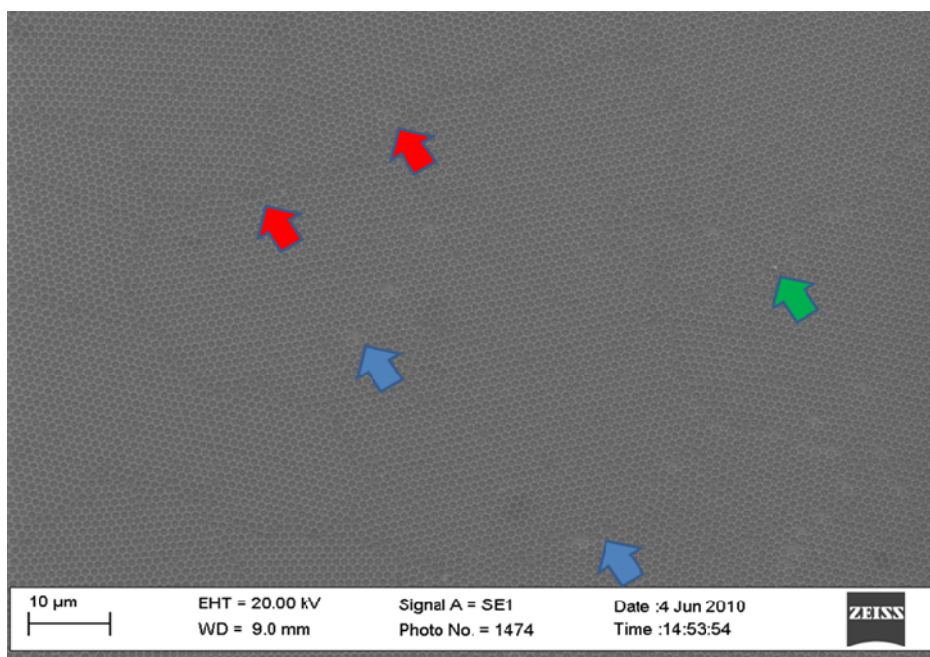


Figure S4: SEM image of a silica template showing voids (blue arrows), domain boundaries (red arrows) and bi-layer created from a trapped nanosphere (green arrow)

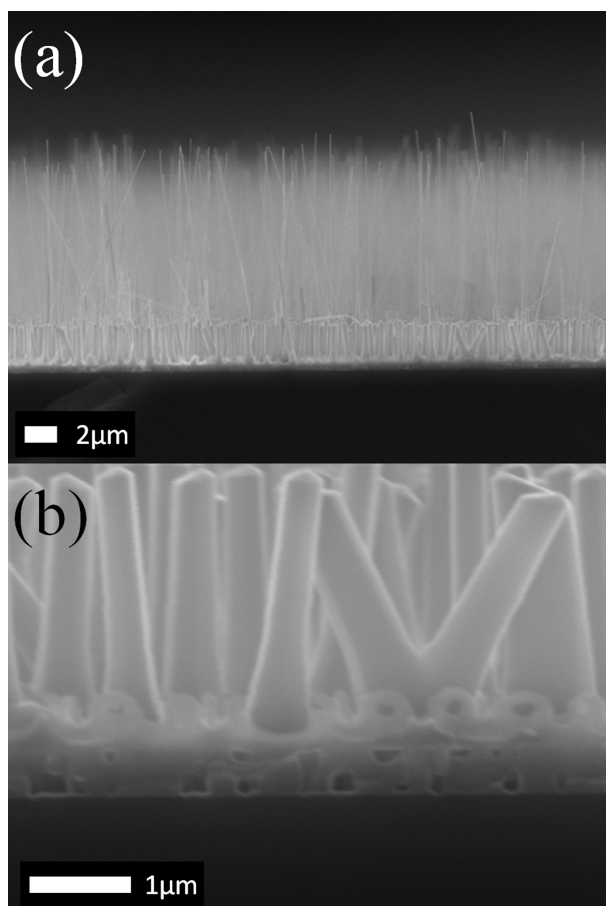


Figure S5: SEM images showing 90° views of a ZnO ordered array where (a) additional long and thin, high aspect ratio nanorods were observed (b) dual nanorod nucleation/crystal twinning was observed.

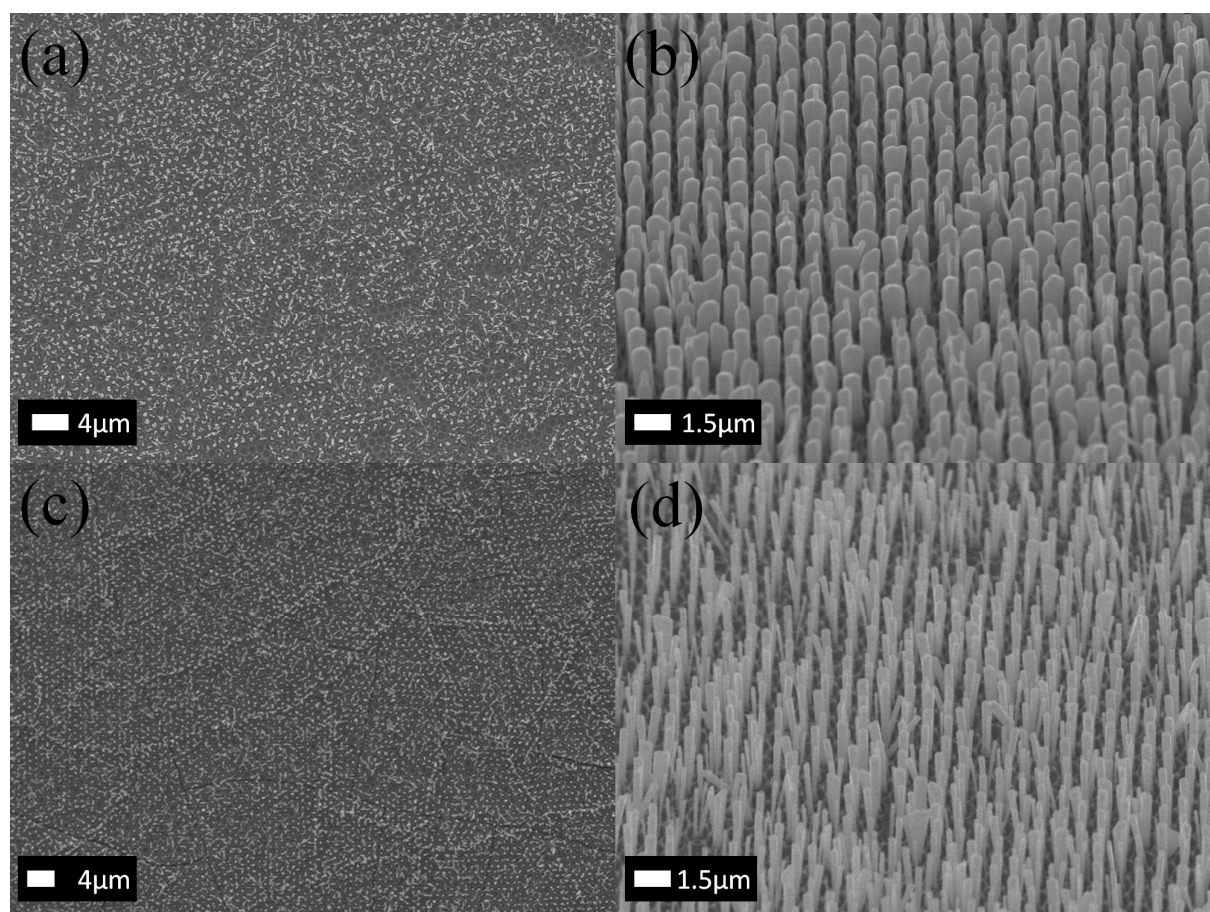


Figure S6: SEM images of 1 μm spaced VPT grown ordered arrays on *a*-sapphire substrate, in plan view (a), 45° view (b) and on quartz substrate, in plan view (c), 45° view (d).

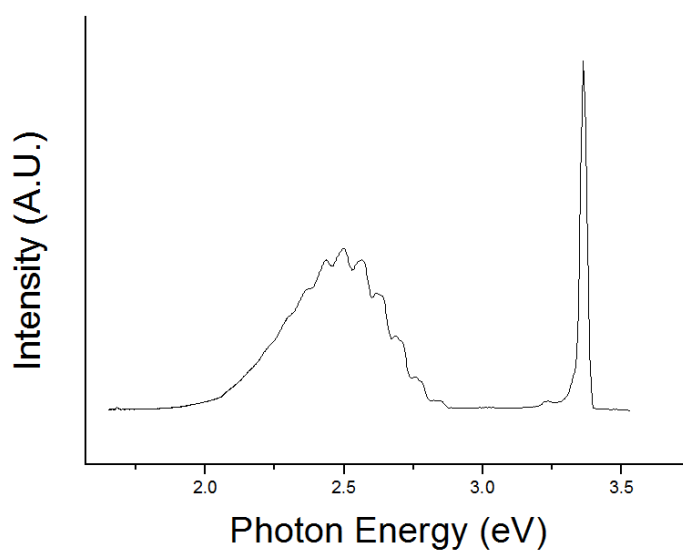


Figure S7: Low temperature PL (~8 K) of VPT deposited ordered array showing near band edge emission and structured green band emission.