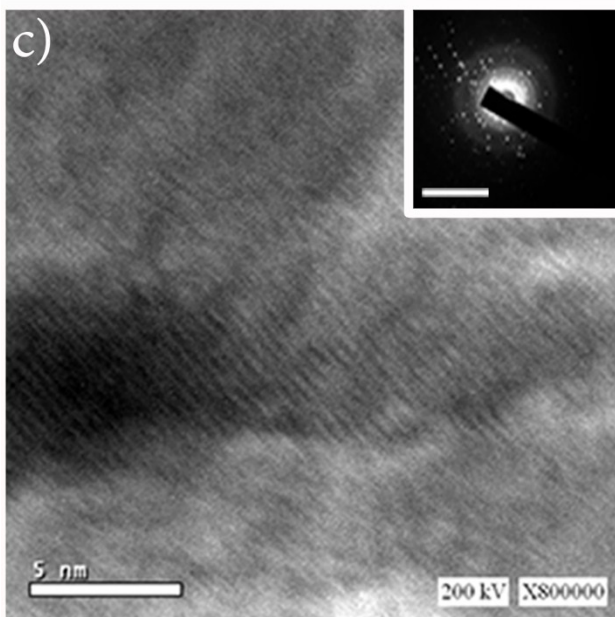
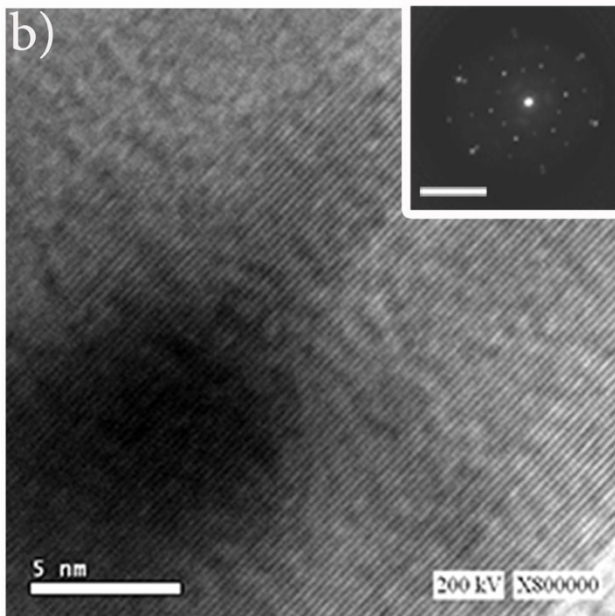
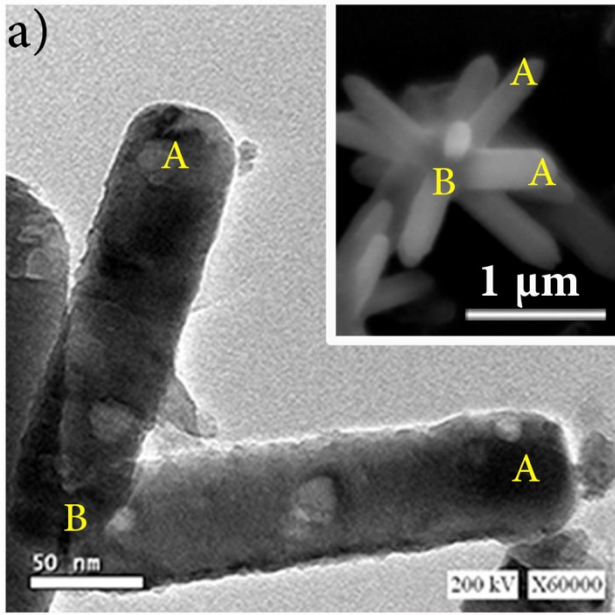
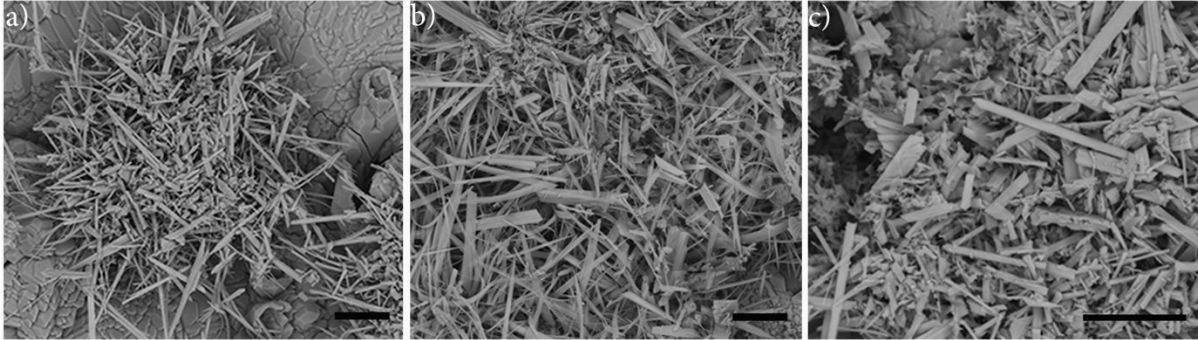


S1: Illustration of growth units that connected and fastened in a position by hydrogen bonds followed by dehydration reactions where more stable oxygen bonds are formed to minimize the geometric configuration energy.



S2: (a) HRTEM image of flower braches, the inset shows an SEM image of complex flower-like structure, (b and c) (0002) lattice spacing at rod end and twinning core points, respectively; the insets show their SAED images representing the variation in degree of lattice spacing order [Scale bar is 200 nm].



S3: FESEM images of Co-doped ZnO growth as a function of concentration;; (a) 0.075, (b) 0.1 and (c) 0.125 M at 90 °C with ZnO seed layer. By increasing ionic strength, random aggregation with no assemblage or well-definite geometric morphology can be achieved. [Scale bar is 10 μm]