

Supporting Information

Shape-controlled Cobalt Phosphide Nanoparticles as Volatile Organic Solvent Sensor

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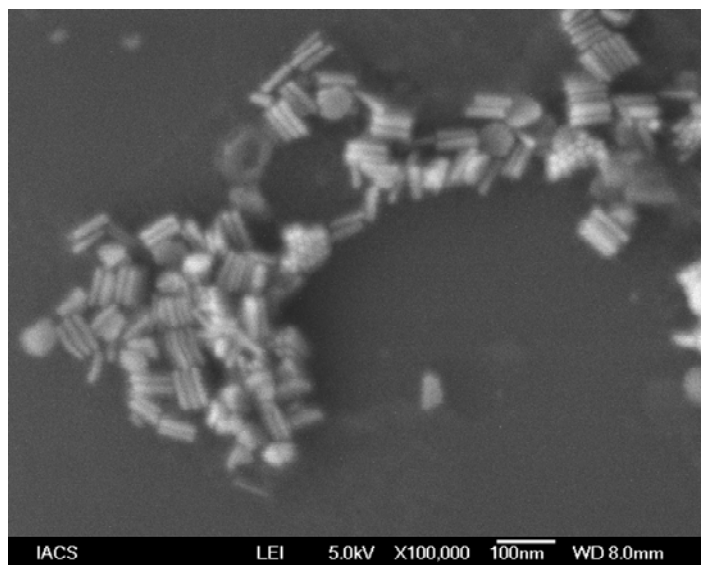


Figure S1. SEM images of high aspect ratio cobalt phosphide NRs synthesized at 300 °C after 300 min of annealing time.

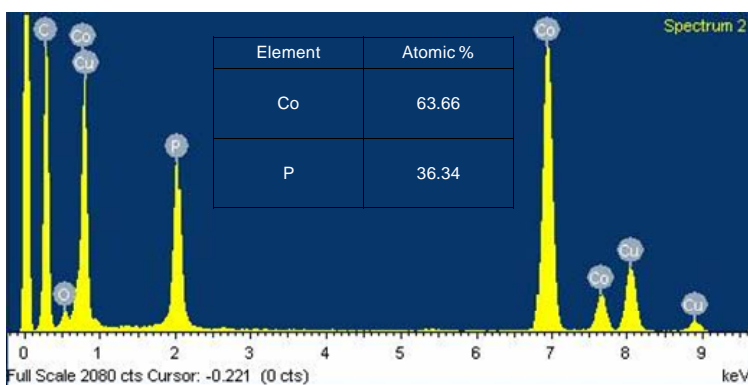


Figure S2. EDX spectrum of high aspect ratio cobalt phosphide NRs formed after 300 min of reaction annealing time at 300 °C revealing the presence of Co and P. Atomic percentage of Co and P is listed in the inset table. The EDX was collected from a broad sample area.

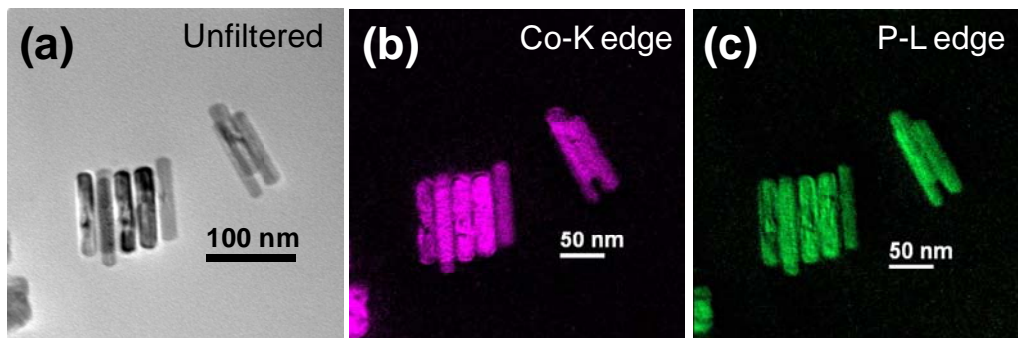


Figure S3. (a) Unfiltered TEM of high aspect ratio cobalt phosphide NRs. (b-c) EFTEM mapping of hollow cobalt phosphide NRs using Co-K and and P-L energies formed after 300

min of reaction annealing time at 300 °C revealing the presence of Co and P throughout the NRs.

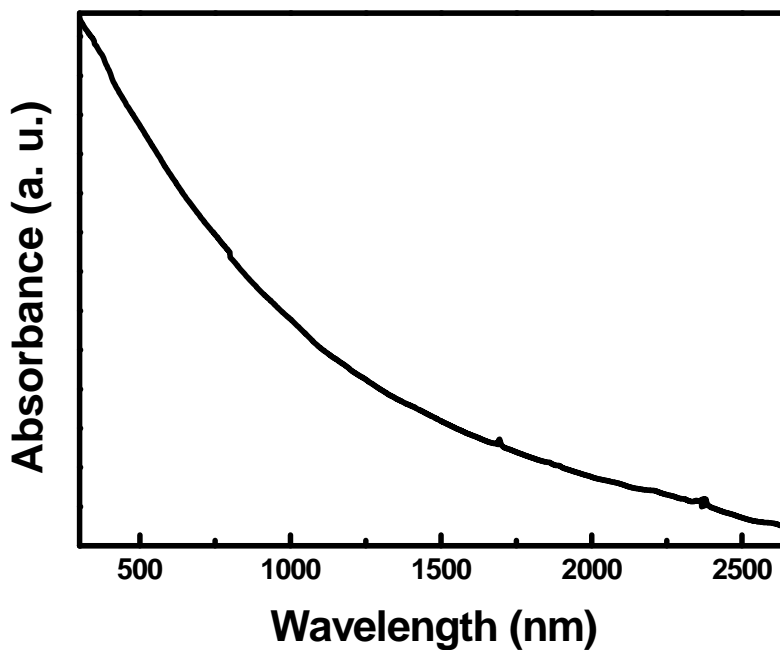


Figure S4. UV-Vis-NIR absorption spectra of high aspect ratio cobalt phosphide NRs formed after 300 min of annealing time at 300 °C in TCE solvent.

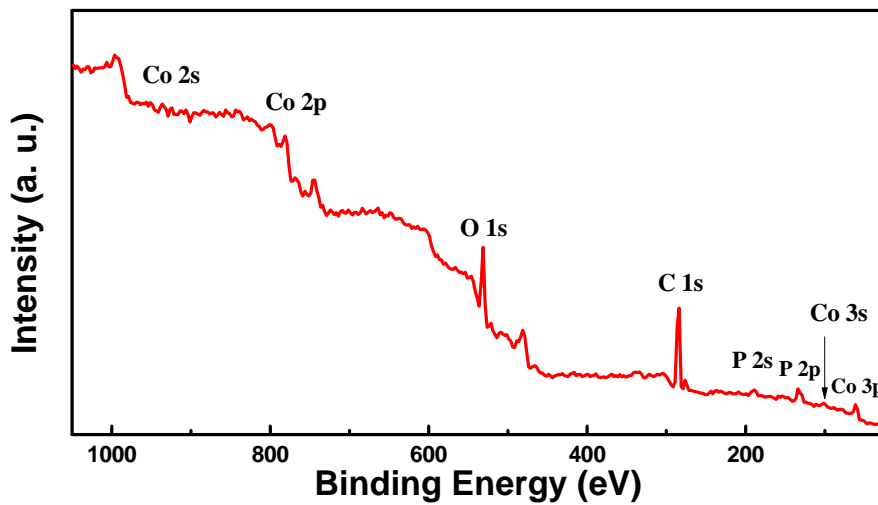


Figure S5. XPS spectrum of high aspect ratio cobalt phosphide NRs formed after 300 min of annealing time at 300 °C.

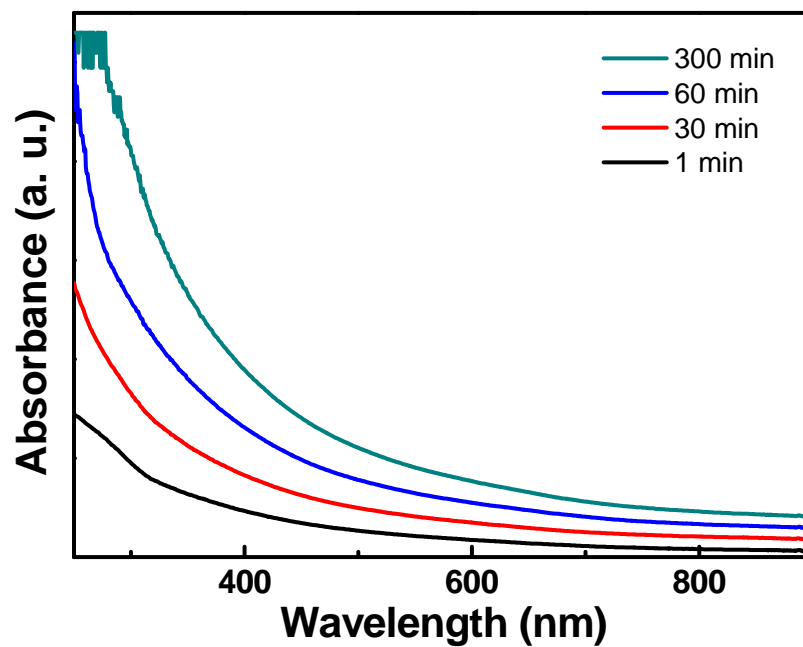


Figure S6. UV-Vis absorption spectra comparison of cobalt phosphide NPs formed at 300 °C with different reaction annealing time. There is no change of absorption nature with increasing annealing time of reaction.

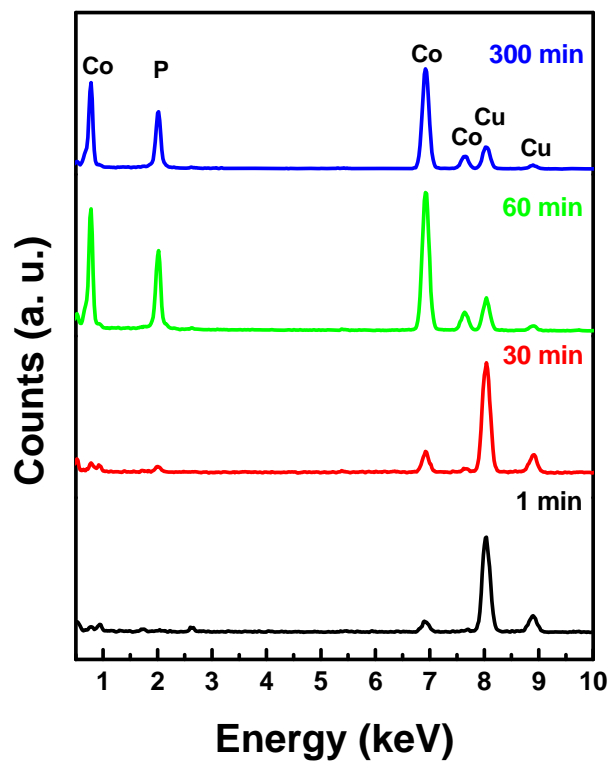


Figure S7. EDX data comparison of cobalt phosphide NPs formed at 300 °C with reaction annealing time variation. EDX data of reaction products formed after 1 min, 30 min, 60 min and 300 min of annealing time is compared here.

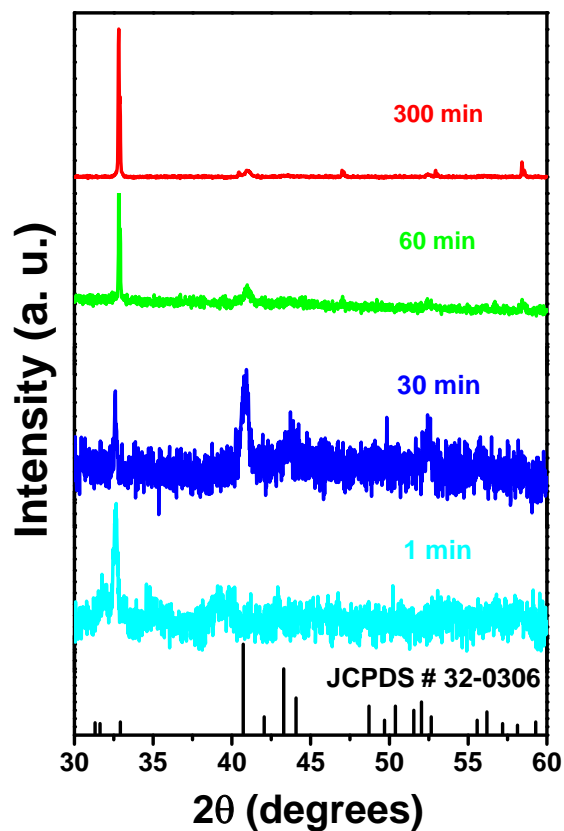


Figure S8. XRD data comparison of cobalt phosphide NPs formed at 300 °C with different reaction annealing time. XRD data of particles formed after 1 min, 30 min, 60 min and 300 min of reaction annealing time is compared here.

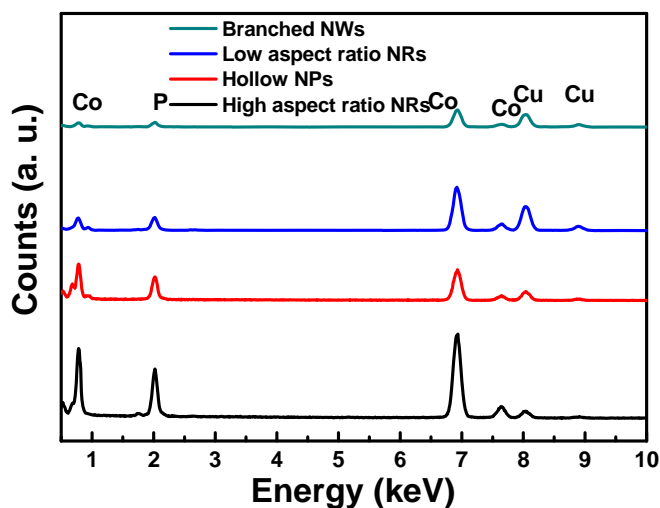


Figure S9. EDX data comparison of different morphological cobalt phosphide NPs formed after 300 min of annealing time at 300 °C. EDX data of cobalt phosphide NPs of high aspect ratio NRs, low aspect ratio NRs, hollow NPs and branched NWs are compared here.

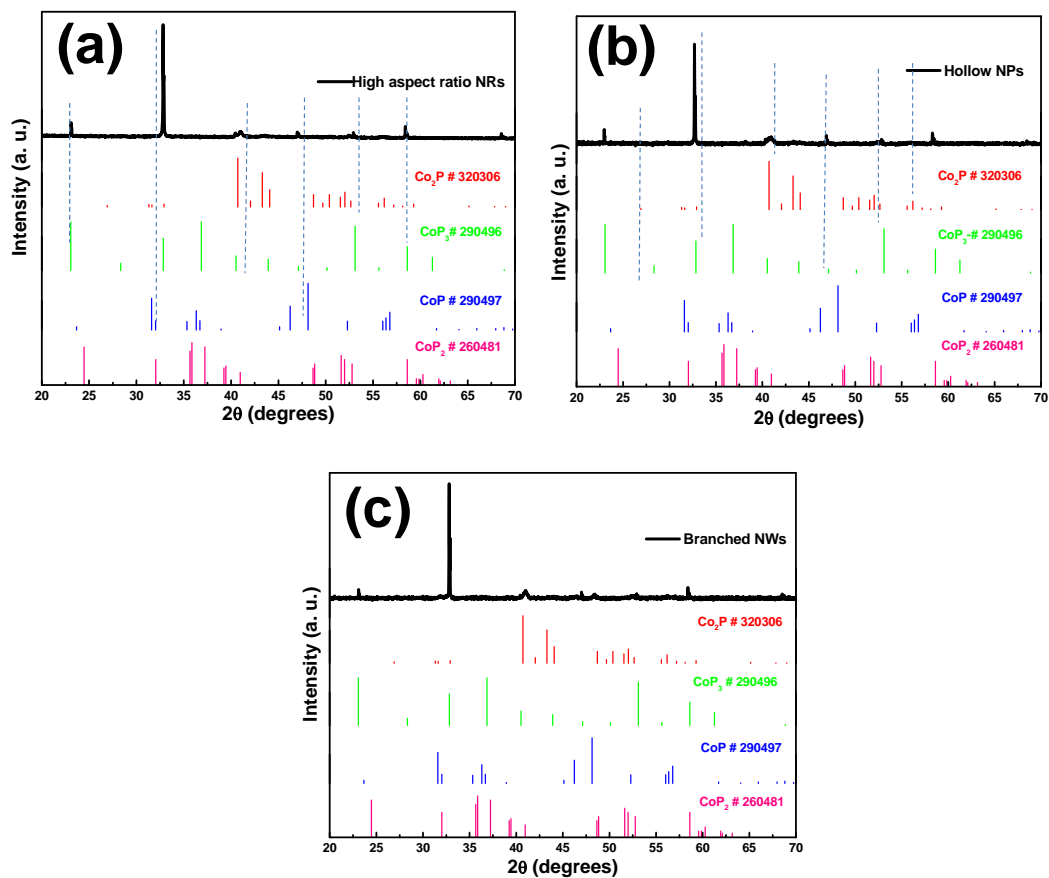


Figure S10. Comparison of standard and experimental XRD pattern of as synthesized different shaped cobalt phosphide NPs. (a) high aspect ratio NRs (b) branched NWs and (c) hollow cobalt phosphide NPs.

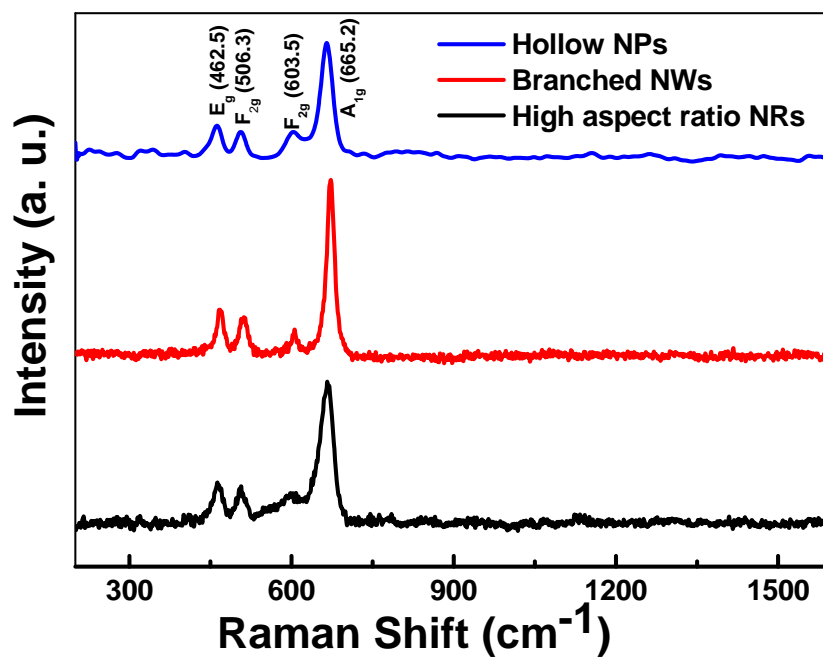


Figure S11. Solid state RAMAN spectra of different morphological cobalt phosphide NPs formed after 300 min of reaction annealing time at 300 °C.

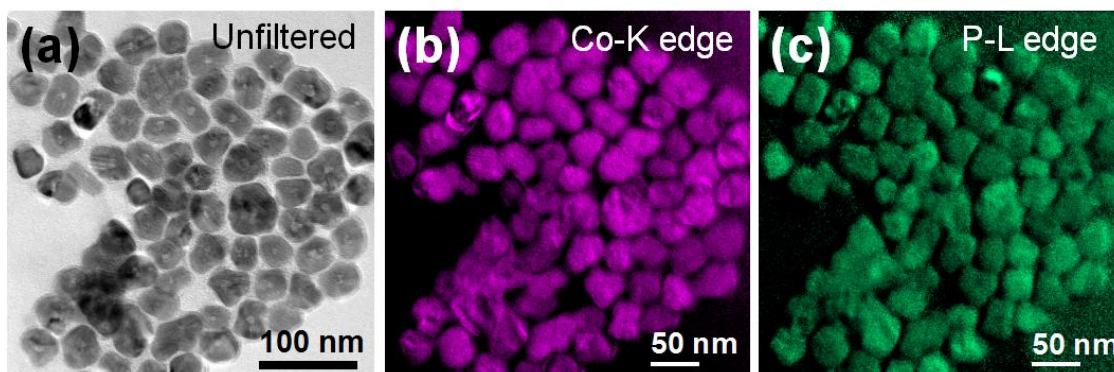


Figure S12. (a) Unfiltered TEM of hollow cobalt phosphide NPs. (b-c) EFTEM mapping of hollow cobalt phosphide NPs Co-K and P-L energies formed after 300 min of reaction annealing time at 300 °C revealing the presence of Co and P throughout the NPs.

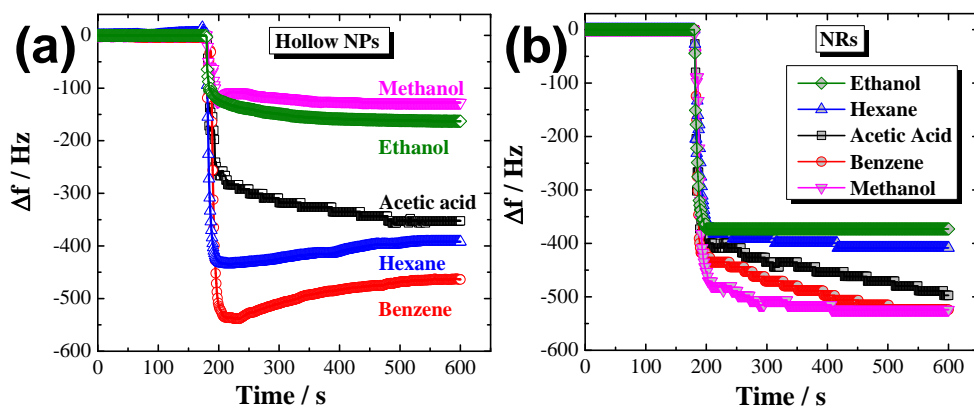


Figure S13. QCM frequency shifts of (a) cobalt phosphide hollow NPs and (b) high aspect ratio cobalt phosphide NRs upon exposure of different solvent vapors (methanol, ethanol, hexane, acetic acid and benzene).