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Growth and Optical property of ZnO nanowire synthesized without catalyst on Si substrate

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Well-aligned single-crystalline wurzite zinc oxide (ZnO) nanowire array was successfully fabricated on Si substrate by a simple physical vapor deposition method at 600°C. TEM observation showed that the ZnO nanowires were synthesized along the c-axial direction of the hexagonal crystal structure. We demonstrate that ZnO nanowires followed the self-catalyzed growth mechanism on the ZnO nuclei without metal catalyst.

We also investigate the optical property of the ZnO nanowire array by photoluminescence (PL) measurement at a room temperature.