

Influence of growth temperature on SnO₂ nanowires

Abstract

Tin oxide (SnO₂) nanowires have been synthesised using a thermal evaporation approach on quartz (SiO₂) substrates in nitrogen atmosphere with a mixture of milled SnO₂ powder and graphite as reactants. The substrates were placed vertically right above the reactants during the growth at 850, 900, 950 and 1000°C. A SnO₂ thin film layer has been used as the nucleation site which is different from the conventional methods of using metal catalyst as seed for growth. SnO₂ thin films have self-catalysed to form SnO₂ nanowires at 950°C. At 850 and 900°C, plenty of SnO₂ clusters landed on the substrates which were originated from the non-vaporised SnO₂ powder. An optimum range of temperature was obtained for growth of clean SnO₂ nanowires which were free from metal catalysts and non-vaporised SnO₂ clusters.

Keyword: Tin oxide; Nanowires; Growth temperature; Morphologies