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CVD assisted preparation of nanostructured materials

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Chemical vapor deposition (CVD) is a widely used method for synthesis of inorganic thin films with systematically tunable properties. In a typical CVD process, one or more volatile precursors are decomposed in reaction chamber and react with substrate surface. Subsequently a thin film is deposited on the substrate.

Thin films containing GeC nanowires and nanodroplets were prepared by low pressure chemical vapor deposition (LPCVD) of hexamethyl digermane (Ge_2Me_6) on stainless steel substrate. Deposition of digermane precursor proceeded in furnace for 90 mins in throughflow mode at 650 °C and pressure 60–80 Pa.

The influence of the substrate surface roughness on GeC nanoparticles growth was investigated using scanning electron microscopy (SEM) and confocal microscopy. Physical and chemical properties of prepared deposits were studied by SEM/FIB/EDX and high-resolution transmission electron microscopy (HRTEM).

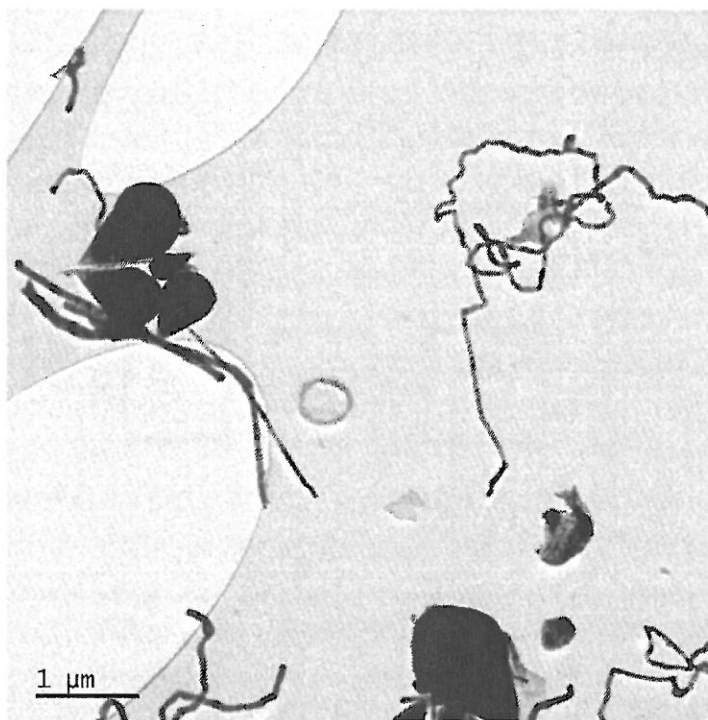


Fig. 1: HRTEM image of GeC nanowires and nanodroplets