

# Synthesis of meso-crystalline Al<sub>2</sub>O<sub>3</sub> nano-platelet coatings using combustion chemical vapor deposition (C-CVD)

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## Abstract

Meso-crystalline alumina (Al<sub>2</sub>O<sub>3</sub>) coatings having a nano-platelet microstructure were synthesized using an indigenously designed combustion chemical vapor deposition facility. Aluminum acetylacetonate of 0.001 to 0.005 M concentrations dissolved in ethanol was used as the precursor. Ultrasonically atomized precursor aerosols were fed coaxially into a flame, where it underwent evaporation followed by decomposition on a substrate kept in the flame. The deposition was carried out at 1150 ± 15 °C. Microstructures consisting of vertically standing isolated and fused hexagonal alumina platelets were obtained using 0.003 M and 0.005 M precursor concentrations, respectively. At lower concentrations (0.001 M) platelets of irregular shapes were observed. The meso-crystalline platelets were of 1.0 to 1.5 μm length and 50 to 100 nm thickness.