FCVD Process for Silicon-Carbide and Alumina Coating

**Silicon Carbide Coating:** A Fluidization-based Chemical Vapor Deposition (FCVD) process has been developed for the thin film coating of Silicon Carbide (SiC) on the surface of different substrates viz. Graphite, Stainless Steel, Zircaloy, Inconel etc. Advantages of the FCVD process is uniform coating thickness and if the substrate is pipe, outer and inner surfaces can be coated with SiC simultaneously. A uniform coating of SiC 50-60 μm thickness has been achieved on graphite surface which has been qualified for 8 cyclic heating (up to 800°C) and cooling (at room temperature). On the surfaces of SS, Inconel and Zircaloy, a uniform coating thickness of 10-20 μm has been achieved.

**Alumina Coating:** FCVD Process is also applicable for alumina (Al₂O₃) coating on the surfaces of different substrates viz. Graphite, Stainless Steel, Zircaloy, Inconel etc.

Fig. 1. Experimental setup of FCVD process
Fig. 2. XRD Analysis of SiC coating on Zircaloy

Fig. 3. (a) Bare and Al2O3 coated Zircalloy-4 tube by FCVD
(b) SiC coated graphite rods
(c) characterization of Al2O3 coating on Zircalloy-4 tube