

## 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  $\mu\text{m}$  thickness has been achieved on graphite surface which has been qualified for 8 cyclic heating (up to 800 $^{\circ}\text{C}$ ) and cooling (at room temperature). On the surfaces of SS, Inconel and Zircaloy, a uniform coating thickness of 10-20  $\mu\text{m}$  has been achieved.

**Alumina Coating:** FCVD Process is also applicable for alumina ( $\text{Al}_2\text{O}_3$ ) coating on the surfaces of different substrates *viz.* Graphite, Stainless Steel, Zircaloy, Inconel etc.



Fig. 1. Experimental setup of FCVD process

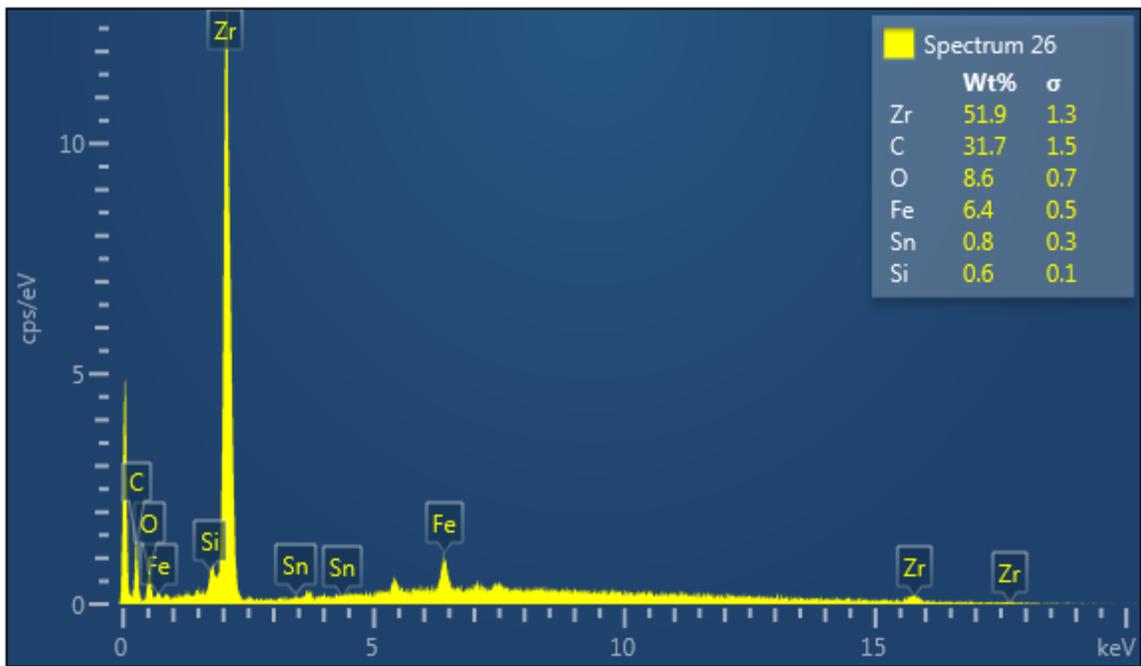


Fig. 2. XRD Analysis of SiC coating on Zircaloy

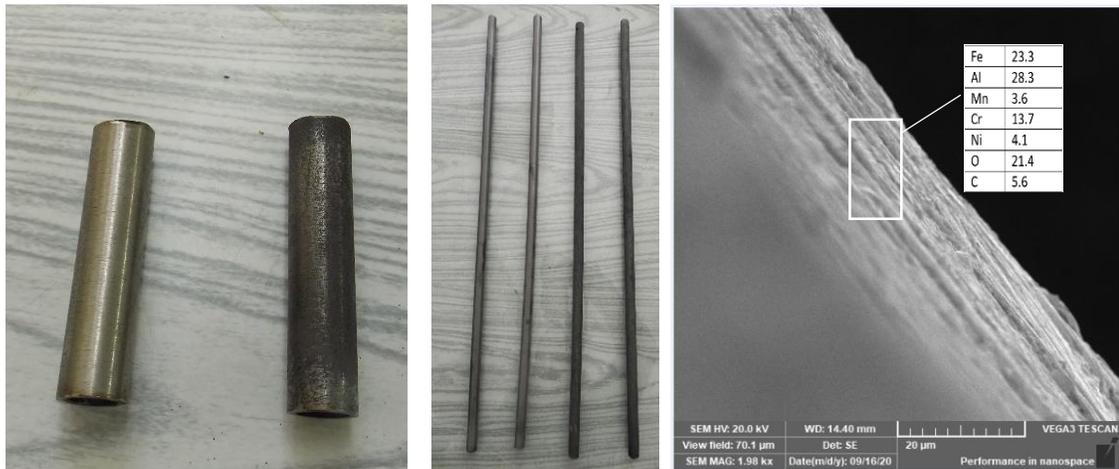


Fig. 3. (a) Bare and Al<sub>2</sub>O<sub>3</sub> coated Zircalloy-4 tube by FCVD  
 (b) SiC coated graphite rods  
 (c) characterization of Al<sub>2</sub>O<sub>3</sub> coating on Zircalloy-4 tube