

Arradiance GEMStar ALD System

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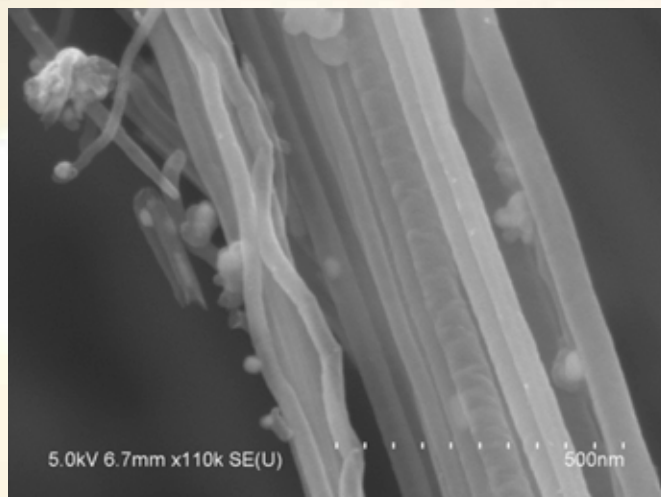


Figure 1: SEM of the coating of aluminum oxide on carbon nanotubes (CNTs), courtesy of Prof. Andy Sun, U. of Western Ontario.

CNF is pleased to announce the availability of a new Arradiance GEMStar 6 ALD system.

This compact table top ALD system is ideally suited for research applications in a multiuser facility. The GEMStar 6 can accommodate substrates up to 6 inches (150mm) and its unique 300°C hot wall chamber design can deposit uniform, conformal metal, and insulating ALD films on flat substrates, 3-D surfaces including high aspect ratio features, nanoparticles and nanopowders. Up to eight precursors can be run simultaneously, producing multi-component films and film stacks.

A very unique feature of the GEMStar system is the particle ALD coating option. It consists of a 2 µm particle canister filter mounted on a variable speed (5-95 rpm) 360 degree continuous rotary driven feedthrough to enable conformal coating of the suspended particles. Nanoparticles can be coated by placing them in a specified container with recipes structured to accommodate the large surface areas with a conformal coating. This system has demonstrated successful conformal Al₂O₃ coatings on 30-70 nm diameter CNTs as well as uniform TiO₂ ALD coatings of networked mesoporous polymeric and carbon films with pore sizes as small as 40 nm.

The particle ALD feature will be an invaluable asset to those research groups wishing to conformally coat nanoscale sized media for a variety of applications.

Initially the GEMStar will be configured for platinum, titanium oxide, aluminum oxide, and silicon oxide ALD films. These thermal ALD films will complement our current dielectric film capabilities on the Oxford FlexAL system. XPS analyses of our initial sample evaluations of the above four films are illustrated below and indicate precise stoichiometric and high purity films.

The versatility of the GEMStar will permit us to add additional precursors in the future to quickly meet the changing demands of the CNF user community. For further information on this system, please contact Vince Genova at Genova@cnf.cornell.edu.

