

NanoGrowth-Catalyst® - A breakthrough in nanomaterials development

A unique nanomaterials development platform offering users supreme flexibility, capability, reliability and low cost of ownership while occupying the minimum clean room floor space.

Nine of the world's leading nanomaterials development technologies in a 1m x 2m cleanroom compatible package...

The NanoGrowth Catalyst offers users the ability to develop process for a wide range of nanomaterials such as nanoparticles and nanoclusters, carbon nanotubes, nanowires and graphene, using:

- Sputtering including co-deposition
- Sputter etch and Ashing
- Nanoparticle deposition
- PECVD DC/RF nanomaterial growth
- LP/HP CVD nanomaterial growth
- Solid/liquid phase catalyst/precursor delivery
- Thermal annealing
- Rapid Thermal Growth (RTG)
- RTP activation

Full user control of every stage of the nanomaterial/structure formation process: diffusion barrier formation, catalyst creation by sputter or nanoparticle deposition, catalyst or material activation, growth of nanowires and nanotubes to post growth metallization, all without breaking vacuum, at the touch of a button.

CONSISTENT RESULTS

Better quality materials result from minimising contamination and oxidation. The NanoGrowth Catalyst is the only nanomaterials development system that is capable of maintaining the substrate under vacuum throughout the nanomaterial or nanostructure growth process.

As widely recognised, many nanomaterial catalysts exhibit rapid exothermic or non-repeatable reactions on exposure to atmospheric gases (e.g. pyrophoric nano Iron). Rapid changes in catalyst state and subsequent growth inconsistencies are removed by maintaining the substrate under vacuum, allowing a wider range of nanoparticles or nanoclusters to be explored under tight control.

CONDITIONS FOR SUCCESS

Reducing the chances for contamination leads to more successful and consistent experimentation. Degassing substrates by a broad band non-contact IR source drives off surface-bound water vapour, offering superior adhesion at the catalyst interface. The RTG source can rapidly condition the catalysed substrate, minimising the effects of particle agglomeration (that can occur with slower substrate heating methods), thus



improving nucleation site density. In operation the system can run down to 5×10^{-6} mTorr further reducing the chances of spurious results through contamination.

MULTIPLE CATALYST CHOICES

Enabling multiple approaches to catalysis, the system can sputter metallic catalysts (incorporating two magnetrons for co-deposition of complex alloyed material catalysts or barriers), and has the option of a Nanocluster source for nanoparticle and cluster deposition. Complex catalysts can be created, as can high surface area materials. The potential exists to further functionalise nanofilaments and tubes. The optional Nanocluster source can mass-select nanoparticles and accelerate them, with a wafer bias, to the surface of the substrate at high or low energies allowing faceting and other nanoscale effects.

BETTER QUALITY FILMS- FASTER

Higher throughput and better films result from a cold wall solution. With shorter times to process temperature than hot wall technology, the hot chuck in the system can be ramped at a controlled rate, and can run at a set temperature, with hot substrate transfer allowing faster times between runs. Shower head gas delivery offers excellent uniformity of reactants across the substrate surface, leading to much more consistent research results.

NANOSOFT®

- SOFTWARE DESIGNED FOR EASE OF USE

Allowing users to focus on the business of research, the software offers easy recipe creation, accurate repeatable control and single button runs, as well as tracking and archiving of all system/process parameters for later reference and analysis.

NanoSoft® has multiple operator / security levels and all system options are included as standard. The Profibus system architecture allows easy porting of any options to the system and seamless accessibility to all system functions and options.

T: +44 (0) 1273 515899

F: +44 (0) 1273 512311

Surrey NanoSystems Ltd
Euro Business Park
Building 24
Newhaven
East Sussex
BN9 0DQ

www.surreynanosystems.com