

New Research on Nanodiamond Materials

September 9 2008



Microwave plasma chemical vapor deposition chamber shown in action growing ultrananocrystalline diamond films at Argonne's Center for Nanoscale Materials.

In a recent special issue of *Chemical Vapor Deposition* devoted to nanodiamonds, editors Amanda Barnard and Oliver Williams note that "the diversity of nanocarbon structures and allotropes has led to a plethora of growth techniques and unique properties, and has opened the door to a number of exciting applications."

An invited review article by Anirudha V. Sumant (CNM) and James Butler (Naval Research Laboratory) shows how nanocrystalline diamond is a designer material that can be tailored to specific applications. Materials that grow by using a suppression of renucleation, similar to conventional diamond growth, are distinguished from materials grown by using intentional enhancement of renucleation processes.

These specially designed nanodiamond materials find use in X-ray windows and lithography, micro- and nanomechanical and optical resonators, tribological shaft seals and AFM probes, electron field emitters, platforms for chemical and DNA sensing, to name a few applications.

The CNM offers a Lamda Technologies microwave plasma chemical vapor deposition system in its user program for the growth of ultrananocrystalline diamond films.

Further reading: "The CVD of Nanodiamond Materials," J.E. Butler and A.V. Sumant, Chem. Vap. Deposition, 14, 145–160 (2008) ([online](#)).

Provided by Argonne National Lab

Citation: New Research on Nanodiamond Materials (2008, September 9) retrieved 9 April 2024 from <https://phys.org/news/2008-09-nanodiamond-materials.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--