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Confined Pulsed Laser Deposition: a fast and low cost method for depositing metastable thin film

Confined Pulsed Laser Deposition (CPLD) is a new, cost-effective method for creating materials like diamond thin films, significantly reducing manufacturing costs by enabling synthesis at room temperature and pressure.

Diamond and other metastable materials have attracted renewed interest in recent years due to their outstanding mechanical, electronic, and optical properties. Diamond coatings have applications in the medical, security, tool, and electronics industries as well as others. Current fabrication methods are slow, complex, and expensive because diamond synthesis requires such high temperature and pressure.

Purdue University researchers have developed a new process called Confined Pulsed Laser Deposition (CPLD) for creating metastable thin film materials, such as diamond and graphite phase carbon over a two-dimensional surface. This new method is faster, cleaner, and more energy efficient than fabrication techniques in use today. Production cost is greatly reduced with CPLD because material can be obtained at room temperature and pressure. CPLD can also be functionalized to coat a large, two-dimensional surface with material if required.

Advantages:

-Material synthesis at room temperature and pressure

-Faster production with less waste

-More energy efficient

-Dramatically lowered manufacturing cost compared to current methods

TRL: 5

Intellectual Property:

Technology ID
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Category
Semiconductors/Fabrication & Process Technologies
Materials Science & Nanotechnology/Advanced Functional Materials
Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies

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