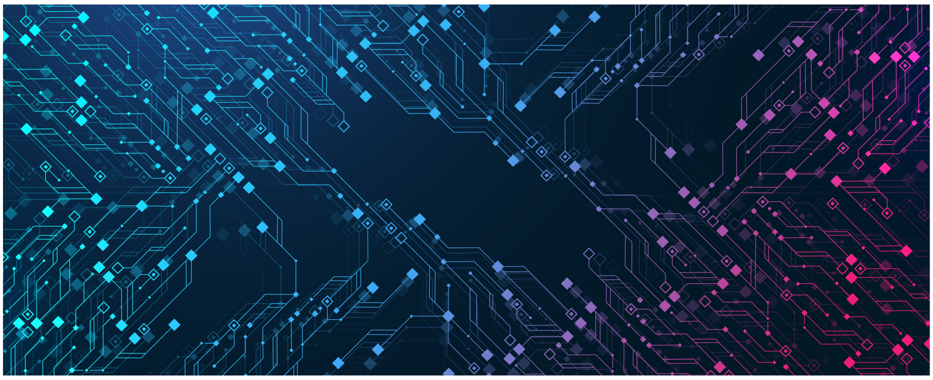
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Electrochemical Liquid Phase Epitaxy

TECHNOLOGY NUMBER: 7207



OVERVIEW

Liquid phase epitaxial growth of high-quality thin film semiconducting crystals

- Simplifies thin film growth using electrodeposition and epitaxy at ambient pressures
- Applicable to photovoltaic cells, LEDs, semiconductor wafers

BACKGROUND

Semiconductors have become fundamental to modern electronic devices, from computers to solar cells. Historically, the production of high-quality thin films of crystalline semiconductors has posed significant challenges, primarily due to stringent processing conditions and complexities in achieving uniform crystal growth. Traditional methods, such as chemical vapor deposition or molecular beam epitaxy, often demand high temperatures, vacuum conditions, and intricate apparatus, making them costly and energy-intensive. These limitations necessitate the development of more efficient, scalable methods for producing thin semiconductor films, which could lead to further advancements in electronic and optoelectronic applications. Therefore, a need exists for an improved method of managing this issue to meet the growing demands for high-performance, cost-effective semiconducting materials.

INNOVATION

Researchers have created a process and reactor cell for the liquid phase epitaxial growth of thin film semiconducting crystals. This method integrates electrodeposition with epitaxy, ensuring a single crystalline orientation while simplifying the growth process. This approach operates under benchtop conditions and ambient pressures, significantly reducing the complexity and cost associated with traditional techniques. Currently, this process has successfully produced

Technology ID
7207

Category
Chemical Processes and Synthesis
Engineering & Physical Sciences

Inventor
Eli Fahrenkrug
Josh DeMuth
Stephen Maldonado

Further information
Jeremy Nelson
jernelso@umich.edu

View online page

uniform Geranium films with controllable thickness and diameters up to 4 inches. While larger-scale tests are pending, the technique shows promise for high throughput applications, given its compatibility with existing methods. Potential real-world applications include the creation of more efficient photovoltaic cells, improved LEDs, and advanced semiconductor wafers, driving further technological advancements in various industries.