PURDUE INNOVATES | Office of Technology Commercialization

Laser Crystallization of Thin Films on Various Substrates at Low Temperature and Atmospheric Pressure

A novel, low-cost, atmospheric-pressure thin film crystallization process operates at low temperatures, enabling broader applications in thin film electronics, solar cells, and LEDs.

Many processes use direct-pulsed laser recrystallization to crystallize thin films because it improves electric mobility and reduces crystal defects. These processes usually require high temperatures and costly vacuum systems, making them non-selective and limiting the materials used for the substrate.

Researchers at Purdue University have developed an alternative process that performs at low temperatures and at atmospheric pressure, making it less costly than currently used processes. This process would be widely used in thin film electronics such as solar cells, LEDs, and flexible electronics.

Advantages:

-Can be performed at low temperatures and at atmospheric pressure

-Compared to alternative processes, less costly

Potential Applications:

-Thin film electronics

-Solar industry

-LEDs

-Flexible electronics

TRL: 5

Intellectual Property:

Technology ID
66045

Category
Semiconductors/Fabrication & Process Technologies
Energy & Power Systems/Power Generation
Materials Science & Nanotechnology/Advanced Functional Materials

Authors
Gary J Cheng
Martin Zhang

Further information
Parag Vasekar
psvasekar@prf.org

View online

Provisional-Patent, 2011-11-22, United States | Provisional-Patent, 2012-01-18, United States | CIP-Patent, 2012-11-21, United States | DIV-Patent, 2015-12-14, United States

Keywords: direct-pulsed laser recrystallization, thin film crystallization, electric mobility improvement, crystal defect reduction, low temperature process, atmospheric pressure process, thin film electronics, solar cells, LEDs, flexible electronics, Crystallization, Electronics, Lasers, LEDs, Materials and Manufacturing, Solar, Thin Films