

LOW COST, LOW-TEMPERATURE POLYCRYSTALLINE SEMICONDUCTOR FILMS FOR SOLAR CELLS AND LARGE SCALE INTEGRATED CIRCUITS

Tech ID: 17830 / UC Case 2007-110-0

ABSTRACT

In the manufacture of very large scale integrated circuits, polycrystalline-silicon (poly-Si) films are typically formed directly by low- pressure chemical vapor deposition (LPCVD) at temperatures above 600C, using silane as the precursor gas. Use of such a high process temperature renders this approach unsuitable for formation of poly-Si films on low-cost glass and plastic substrates and on substrates with completed CMOS integrated circuits. Various other techniques have been attempted, with less than ideal results, toward crystallizing amorphous silicon films without subjecting the material to excessive temperatures for the given application.

Accordingly, a need exists for a method of readily forming polycrystalline films without subjecting the substrate to high temperatures, or requiring the use of complex processing steps.

Researchers at UC Berkeley have developed a technology that enables the forming of polycrystalline semiconductor at low temperatures and without the use of complex processing steps. The technology allows for production of a continuous polycrystalline silicon film with excellent physical and electrical properties. The result is a low-temperature, low-cost substrates such as glass and plastic, which is extremely important for the development and commercialization of solar cells, thin film transistors, and micro-electromechanical systems (MEMS).

SUGGESTED USES

- »
- » Solar Cells
- » Large scale integrated circuits
- » Thin film transistors
- » MEMS

ADVANTAGES

- » Low-Temperature, Low-Cost, Large Scale

PATENT INFORMATION

PCT Application

[PCT/US2008/071809](#)

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OTHER INFORMATION

CATEGORIZED AS

- » **Energy**
- » Solar
- » **Materials & Chemicals**
- » Electronics Packaging
- » Superconductors
- » Thin Films
- » **Semiconductors**
- » Materials
- » Processing and Production

RELATED CASES

2007-110-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,043,943	10/25/2011	2007-110



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