New Technology Offer

Novel method of controlling ion energy and flux in capacitively coupled radio frequency discharges

The energy of ions impacting surfaces during plasma processing is crucial in determining both the properties of materials being deposited by plasmas and for the control of the etching of thin films. The independent control of the ion energy and the plasma density has been the object of intense industrial research. Current technologies for modifying the ion energy rely on the geometry of the plasma processing chamber or by applying low and high frequency RF power that is not phase locked. These techniques are either not applicable to some situations or have only been partially successful.

A new method developed at the Ruhr-University allows the ion energy and plasma density to be decoupled. If the RF power applied to a plasma chamber is comprised of a phase locked fundamental and its second harmonic, the ion energy is a linear function of the phase angle between the two. This simple, but previously overlooked technique will be an enabling technology for future materials and plasma applications.

Application

- Next generation semiconductor processing equipment
- Plasma etching systems
- Plasma deposition systems

Advantages

- Ion energy and ion flux can be independently controlled.
- Fine control over the ion energy.
- The ion energy can be either increased or decreased.
- Ion energy can be adjusted without changing the reactor geometry.
- It is easy to retrofit existing plasma equipment.
- Can be implemented with “off the shelf” RF components

Status Quo

Based on a US-Provisional patent application filed in March 2008, the following applications are currently pending: PCT, Taiwan and Europe.

Contact:
rubitec GmbH
Dietmar Tappe
Stiepeler Str. 129
44801 Bochum
Tel: 0234-32-11969 /-11933
Fax: 0234-32-14194
E-Mail: patente@ruhr-uni-bochum.de
www.rubitec-patente.de

signo
Hochschulen
Schutz von Ideen für die gewerbliche Nutzung
Ein Programm des Bundesministeriums für Wirtschaft und Technologie