[총회초청 II]

PSII (Plasma Source Ion Implantation)

- Applications & Perspective -

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Plasma Source Ion Implantation(PSII) is a relatively new, technique for surface modification of materials for improving surface properties and for semiconductor doping applications. In the PSII process, a plasma is generated in a vacuum chamber and series of high negative voltage pulses are applied to the target immersed in the plasma. As a result, the ions in the plasma are attracted to the surface of the target at very high velocities and penetrate the lattice structure of the target material. The implantation of high energy ions into the near surface regions of the target results in chemical and microstructural changes at the surface leading to relevant changes in the surface properties of the target. A principle advantage of the PSII process is its non-line-of-sight nature which makes it cost-effective for the implantation of three dimensional targets. In addition to implantation, the PSII process can be used to deposit overlay coatings with a degree of mixing at the interface that assures good adhesion.

There is growing worldwide interest in PSII due to its applicability to a variety of materials and materials processing problems. Over the last five years this technology has been investigated by a variety of academic institutions and industries. To date there are at least 60 operational PSII systems worldwide. The technology has been referred to by a variety of names such as PSII, Plasma implantation(PI), ion clading(IONCLAND), and plasma doping(PLAD).

PSII is inherently an interdisciplinary technology, involving expertise in the areas of high voltage electronics, plasma physics, and materials science. The possibilities of basic plasma physics and materials science research as well as applications in materials and semiconductor industries have generated significant interest in PSII technology in universities, national laboratories, equipment manufacturers, and potential end users of the technology. This diversified interest made possible the three international workshops in the area of PSII held at Madison-Wisconsin, Sidney-Australia, and Dresden-Germany.

In this talk, the applications area and the perspectives of PSII process will be addressed and discussed.