and an unbalance of the order of 0.001 gram-mm can be achieved. The second module is a soft bearing assembly balancing machine utilized for high speed balancing of the complete assembly of the pump which is run under a simulated condition. The balancing is achieved by applying the required mass correction and controlling the vibration levels at various speeds upto an operating speed of 50,000 rpm. A vibration level of 0.1 mm/sec has been achieved at the operating speed of the turbo-molecular pump after assembly balancing.

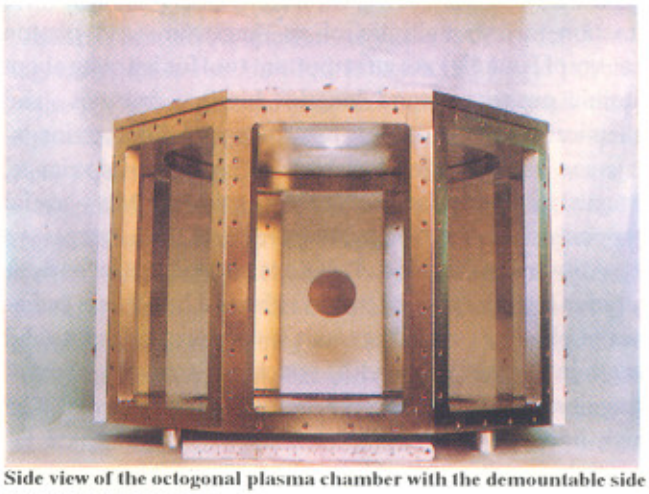
Photoluminescent porous silicon: fabrication and characterization

Porous silicon has been fabricated by electrochemical anodizing of single crystal silicon wafers. The morphology of the porous layers depends on several factors such as anodic or cathodic over potential, electrolyte composition, dopant concentration, and ambient light conditions. Though single cell approach for fabrication is simpler than the two cell approach, it produces non-uniform porous layers. The current density during the experiments is kept below the electropolishing range. We have standardized a procedure of fabrication of photoluminescent porous silicon with the two cell approach. The characterization of porous silicon has been done by photoluminescence measurement using the UV radiation from a nitrogen laser, and by electron microscopy. The photoluminescence peak is near 600 nm and has full-width at half-maximum (FWHM) of about 140 nm. The peak of photoluminescence corresponds to a bandgap more than 2.0 eV, which is far above the bandgap of single crystal silicon. The photoluminescence is stable and does not degrade on exposure to atmospheric conditions. Scanning electron microscopy of photoluminescent porous silicon reveals that the silicon column sizes are about one micron and the porous layers have uniform porosity (cover photograph). Transmission electron microscopy shows sharp electron diffraction patterns and does not show the presence of an amorphous phase in porous silicon.

INFRASTRUCTURAL DEVELOPMENT

Octogonal plasma chamber

The workshop has designed and fabricated a large octogonal plasma chamber to study laser plasma in the VUV and X-ray region. The SS chamber of height 48 cm and octogonal face to face distance of 70 cm has demountable side flanges on all the eight sides as well as on the top. This enables easy installation of various diagonostic devices. The chamber has been leak tested to $1x10^{-8}$ std. cc/sec (helium) and a vacuum of $2x10^{-5}$ mbar has been obtained during vacuum testing.



Side view of the octogonal plasma chamber with the demountable side flanges partly removed.

Afforestation activity at CAT

Horticulture section has taken up a large afforestation programme in CAT since last year with a plan to plant about 28,000 trees during the eighth five year plan. About 7000 trees have been already planted during 1992-93 and work has started this year to plant about 10,000 trees.

Dr D D Bhawalkar, Director, CAT planting a sapling (right) as part of the afforestation programme at CAT on 21.7.93.

Computer facility

A supermini computer based on a RISC R-3000 processor has been commissioned for scientific computing purpose. A network-based telex software, which enables users to send telex messages using CATNET, has been developed.