

Thin film Process : For superconducting thin film deposition (Nb thin films) by sputtering technique

Equipment: UHV magnetron sputtering unit (DC sputtering).

Photograph :

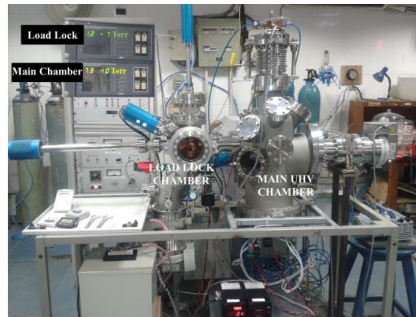


Fig. 1: UHV magnetron sputtering system

Basic Principle:

In this process a gaseous plasma of typically inert gas ions such as Argon (Ar^+) is created and the positive ions are accelerated by an electrical field to the target material which acts as the negatively charged electrode. The atoms from the target materials are ejected by bombardment of energetic ions and deposited on the desired substrate to form a film of the target materials.

Capabilities:

The sputtering flange is UHV compatible and is equipped with 3 magnetrons which can be operated simultaneously for making composite films and alloys of three different materials. In addition to base pressure in the UHV range, this system has the options for the samples to be heated up to 820°C with a Mo heater closely sitting above the sample holder. This system is used mainly to grow high quality superconducting thin films of Nb.

Sample Requirement:

Substrates should be compatible with UHV conditions, Max size - 5mm x 5mm