

## DECABORANE ION SOURCE

### Abstract

An ion source (50) for an ion implanter is provided, comprising a remotely located vaporizer (51) and an ionizer (53) connected to the vaporizer by a feed tube (62). The vaporizer comprises a sublimator (52) for receiving a solid source material such as decaborane and sublimating (vaporizing) the decaborane. A heating mechanism is provided for heating the sublimator, and the feed tube connecting the sublimator to the ionizer, to maintain a suitable temperature for the vaporized decaborane. The ionizer (53) comprises a body (96) having an inlet (119) for receiving the vaporized decaborane; an ionization chamber (108) in which the vaporized decaborane may be ionized by an energy-emitting element (110) to create a plasma; and an exit aperture (126) for extracting an ion beam comprised of the plasma. A cooling mechanism (100, 104) is provided for lowering the temperature of walls (128) of the ionization chamber (108) (e.g., to below 350° C) during ionization of the vaporized decaborane to prevent dissociation of vaporized decaborane molecules into atomic boron ions. In addition, the energy-emitting element is operated at a sufficiently low power level to minimize plasma density within the ionization chamber (108) to prevent additional dissociation of the vaporized decaborane molecules by the plasma itself.

Fig. 2