

ABSTRACT

SYSTEM AND METHOD FOR CLEANING CONTAMINATED SURFACES IN AN ION IMPLANTER

A method and system is provided for cleaning a contaminated surface of a vacuum chamber, comprising means for (i) generating an ion beam (44) having a reactive species (e.g., fluorine) component; (ii) directing the ion beam toward a contaminated surface (100); (iii) neutralizing the ion beam (44) by introducing, into the chamber proximate the contaminated surface, a neutralizing gas (70) (e.g., xenon) such that the ion beam (44) collides with molecules of the neutralizing gas, and, as a result of charge exchange reactions between the ion beam and the neutralizing gas molecules, creates a beam of energetic reactive neutral atoms of the reactive species; (iv) cleaning the surface (100) by allowing the beam of energetic reactive neutral atoms of the reactive species to react with contaminants to create reaction products; and (v) removing from the chamber any volatile reaction products that result. Alternatively, the method and system include means for (i) generating an energetic non-reactive (e.g., xenon) ion beam (44); (ii) directing the non-reactive ion beam toward a contaminated surface (100); (iii) introducing a cleaning gas (70) proximate the contaminated surface, comprised at least partially of a reactive species (e.g., fluorine) component; (iv) dissociating the cleaning gas using the ion beam (44) to create a supply of energetic reactive neutral atoms of the reactive species; (v) cleaning the surface (100) by allowing the energetic reactive neutral atoms of the reactive species to react with contaminants to create reaction products; and (vi) removing from the chamber any volatile reaction products that result.

Fig. 1 ...