

ABSTRACT

ION SOURCE CLEANING IN SEMICONDUCTOR PROCESSING SYSTEMS

Cleaning of an ion implantation system or components thereof, utilizing a reactive cleaning reagent enabling growth/etching of the filament in an ion source of the arc chamber, by appropriate control of temperature in the arc chamber to effect the desired filament growth or alternative filament etching. Also described is the use of reactive gases such as XeFx, WFx, AsFx, PFx and TaFx, wherein x has a stoichiometrically appropriate value or range of values, for cleaning regions of ion implanters, or components of implanters, in in situ or ex situ cleaning arrangements, under ambient temperature, elevated temperature or plasma conditions. Among specific reactive cleaning agents, BrF₃ is described as useful for cleaning ion implant systems or component(s) thereof, in in situ or ex situ cleaning arrangements. Also described is a method of cleaning the forelines of an ion implant system for at least partial removal of ionization-related deposit from said forelines, comprising contacting said forelines with a cleaning gas wherein said cleaning gas is chemically reactive with said deposit. Also described is a method of improving the performance and extending the lifetime of an ion implant system, comprising contacting the cathode with a gas mixture.

[No Suitable Figure]