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Ion mass spectrometry in plasma doping system JOHN (BON-WOONG) KOO, ZIWEI FANG, LUDOVIC GODET, JAMES BUFF, DEVEN RAJ, TIMOTHY MILLER, Varian Semiconductor Equipment Associates — Plasma doping provides cost effective dopant implantation in semiconductor device fabrication. Unlike conventional beamline implantation, plasma doping is not mass-analyzed, making control of the ion species in the low temperature plasma very important. It is also a pulsed system, making time resolution important. We report time-resolved measurements during and after the high voltage pulse in BF3 plasma. For B2H6, we report a correlation between ion mass spectrum data and processed wafer data. For AsH3, we report the ion composition changes with respect to several plasma parameters. These investigations have led to a better understanding of the gas phase phenomena, including the electron-radical interactions.

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