

Abstract Submitted  
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**Simulations of an Ar/HBr/O<sub>2</sub> microwave source etch process and the effect of SiBr and SiBr<sub>2</sub> cross-sections on computed etch-profiles**  
JAMES MUNRO, JONATHAN TENNYSON, University College London, SONG-YUN KANG, Tokyo Electron Limited, DANIEL BROWN, Quantemol Ltd. — Electron–molecule scattering calculations are performed for SiBr and SiBr<sub>2</sub> using Quantemol-N.<sup>1</sup> These cross-sections are then used to construct a set gas phase reactions for the plasma simulation. An etch-profile simulation is then performed using the Monte Carlo Feature Profile Model (MCFPM)<sup>2</sup> with inputs supplied by simulation of an Ar/HBr/O<sub>2</sub> plasma. Computed cross-sections include the total elastic cross-section, dissociative electron impact cross-sections, ionisation cross-sections and an estimate of the dissociative attachment cross-section. The use of Ar/HBr/O<sub>2</sub> chemistries have been studied previously<sup>3,4</sup> and a reduction in microtrenching was found when HBr was included. An analysis of the contribution of SiBr and SiBr<sub>2</sub> to the computed etch profile will be presented at the conference.

<sup>1</sup>J. Tennyson *et al*, J. Phys.: Conf. Ser., 86, 012001 (2007)

<sup>2</sup>R. J. Hoekstra *et al*, J. Vac. Sci. Technol. A 15, 1913 (1997)

<sup>3</sup>J. M. Lane *et al*, J. Vac. Sci. Technol. A 18, 188 (1999)

<sup>4</sup>S. A. Vitale *et al*, J. Vac. Sci. Technol. A, 19, 2197 (2001)

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