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Computer modelling of cryogenic etching in SF6/O2/SiF4 and CxFy inductively coupled plasmas[1] QUAN-ZHI ZHANG, ANNEMIE BOGAERTS, University of Antwerp — Plasma etching plays a more and more important role in microchip fabrication, due to its anisotropy during surface processing. However, current state-of-the-art plasma processing faces significant challenges when going beyond 14 nm features, such as plasma induced damage. A novel process with limited plasma damage is cryogenic etching of low-k material with SF6/O2/SiF4 and CxFy plasmas. In this work, a hybrid Monte Carlo-fluid model is employed to describe the plasma behavior, including the species and temperature distributions and power deposition, for SF6/O2/SiF4 and CxFy gas mixtures, applied for cryogenic etching under various gas ratios and operating conditions, which can help to establish an optimal process window.

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