

### Numerical 3D simulation of plasma etch profile with real plasma chemistry

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Plasma etching technology is emerging as one of the key bottleneck processes toward sub-10nm device. It is regarded that this technology is beyond the engineering regime of computer-aided development due to its inherent complexity. However, the empirical knowledge of plasma technology has taken the lead in its development so far but may be faced with limitation for the development of next-generation process. As a part of an effort to overcome these limitations, we have developed a 3D feature profile simulator strongly coupled with Zero-D bulk plasma module considering the realistic plasma chemistry. Recently, the universal surface reaction model was developed in our group. In this work, novel surface reaction model is incorporated with the 3D feature profile simulator. Finally, this approach is verified with the experimental data for a wide range of plasma conditions. We believe that this work can open new insight into plasma technology toward sub-10 nm devices.