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Characteristics of in-situ chamber cleaning for DPS+ metal etcher by using optical emission spectroscopy YONGHWAN RYU, WOO-JIN CHO, YONGWOO LEE, MINCHUL CHAE, SUNGUN KWON, JAESEUNG HWANG, Samsung Electronics, SAMSUNG ELECTRONICS PROCESS DEVELOPMENT TEAM[1] — Plasma enhanced in-situ chamber cleaning (ICC) is generally used for plasma processes such as plasma etching system and plasma enhanced chemical vapor deposition (PECVD) system. It is generally believed that ICC makes a chamber condition to be constant and be able to extend wet cleaning period. We have studied ICC characteristics for DPS+ metal etcher by using the optical emission spectroscopy (OES) as a function of the source power, the chamber pressure and the composition and total flow rate of the gases used. We observe that the higher source power and the lower pressure are more efficient for the ICC and also investigate the effects of the additional gases. We have applied our ICC condition to the patterned wafers and concluded that the chamber condition is maintained in a stable way. However, ICC treatment to the chamber result in some process changes such as the profile of the metal line and the oxide recess and the etch selectivity of the metal line to the oxide hard mask.

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