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Surface loss rate of H and N radicals in H₂/N₂ plasma etching process CHANG SUNG MOON, KEIGO TAKEDA, TOSHIO HAYASHI, Nagoya University, SEIGO TAKASHIMA, Nagoya Urban Industries Promotion Corp., MAKOTO SEKINE, Nagoya Univ. and JST-CREST, YUICHI SETSUHARA, Osaka Univ. and JST-CREST, MASAHARU SHIRATANI, Kyushu Univ. and JST-CREST, MASARU HORI, Nagoya Univ. and JST-CREST — As ULSI devices are down to nano-scale size, there have been many efforts to develop low dielectric constant (low-k) materials and establish the plasma etching technology. Especially, the interaction between the plasma and the surface has an enormous influence on characterizing the etching process. However, the reactions in contact with solid surface such as substrate and wall are very complicated and moreover, at present, there are many interactions unknown and they are not fully understood yet. In this study, surface loss probabilities of H, N radicals on stainless steel and organic low-k film surfaces are investigated by vacuum ultraviolet absorption spectroscopy (VUVAS) technique. The changes of H, N radical densities are quantitatively measured in H₂/N₂ plasma afterglow and the loss rates on each surface are evaluated. It is expected that the development of plasma etching process can be advanced by understanding the reaction of radicals with the surface during organic low-k etching process.

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