Photo-resist Etching in Si(100) Wafer Cleaning through Large Area He/O_2 and Ar/O_2 Plasma Source at Atmospheric Pressure

정미희*, 최호석
충남대학교 화학공학과
(jungmh@cnu.ac.kr*)

In this study, the effect of Ar and He with O_2 atmospheric pressure plasma on photo-resist etching of Si wafer cleaning have been investigated. The photo-resist etch rates of Ar/O_2 plasma show several times faster than that of He/O_2 plasma in the experimental condition, such as power, nozzle to sample distance, flow rate, treatment time and O_2 composition because the ion density of Ar plasma was higher than that of He plasma and also Ar plasma discharge is much farther downstream than He plasma discharge in the atmospheric pressure. After the plasma treatment, the photo-resist etched surface was examined with Atomic Force Microscopy (AFM) and X-ray photoelectron spectroscopy(XPS). AFM results show that the surface morphology by the Ar plasma treatment is similar to that by He plasma treatment. But when we added the oxygen gas to Ar and He gas, the Ar/O_2 etched surface was rougher than the He/O_2 etched surface because Ar plasma was changed to filament discharge more quickly than He plasma. XPS result shows that Ar/O_2 atmospheric pressure plasma can completely remove the carbon contamination on the silicon surface.