On finding low Global Warming Potential (GWP) precursor for SiO₂ etching through plasma radical measurement CHUL HEE CHO, Chungnam National University, SIJUN KIM, Chungnam National University, Nanotech Optoelectronics Research Center, JANGJAE LEE, YEONGSEOK LEE, SANGHO LEE, INHO SEONG, SHINJAE YOU¹, Chungnam National University — C₄F₈, and CF₄ are precursor for etching SiO₂, but they have high Global Warming Potential (GWP), so many researches to find low GWP precursors were investigated. However, the problem is that if the low GWP precursors were found, SiO₂ etching characteristics with those precursors should be researched by SiO₂ etching process, so it takes too much time. In this research, we proposed a new mechanism to forecast SiO₂ etch rate, and Si/SiO₂ selectivity by diagnostics of plasma radical density. The radical diagnostics data shows that C₄F₉I has similar selectivity and SiO₂ etch rate with C₄F₈, and C₆F₁₂O has better selectivity and SiO₂ etch rate than C₄F₈. To verify this mechanism, SiO₂ etch data were analyzed by Scanning Electron Microscope (SEM) and it confirmed well with this mechanism. This research contributes plasma diagnostics in etching process.

¹Corresponding author