



Ferroelectricity in Fluorite Structure Oxides for Future Memory Devices **Min Hyuk Park, Assistant Professor, Pusan National University**

The ferroelectricity in fluorite structure oxides including (doped) HfO_2 and ZrO_2 has attracted increasing interest since the original report in 2011.[1] The fluorite structure ferroelectrics have various advantages over conventional ferroelectric materials including Si-based complementary metal oxide semiconductor-compatibility, matured deposition techniques such as atomic layer deposition, a low dielectric constant and the resulting decreased depolarization field, and stronger resistance to hydrogen annealing.[2-4] However, there are several remaining issues to be utilized as materials for universal memory devices. To date, the fluorite structure ferroelectrics suffer from reliability issues including the wake-up effect, imprint, and insufficient endurance. In this technical talk, therefore, the two main topics will be presented.: the advantages of fluorite-structure ferroelectrics for memory applications are reviewed from a material's point of view. After that, the critical issues of wake-up effect and insufficient endurance are examined, and potential solutions for the aforementioned issues are subsequently discussed.

1. T. S. Boescke et al. Appl. Phys. Lett. 99, 102903 (2011).
2. M. H. Park et al. Adv. Mater. 27, 1811-1831 (2015).
3. M. H. Park et al. MRS Comm. 8, 795-808 (2018).
4. T. Mikolajick et al. MRS Bull. 43, 340-346 (2018).