(Supplemental)

The effect of oxygen source on ferroelectricity of atomic layer deposited $Hf_{0.5}Zr_{0.5}O_2$ thin film

Yong Chan Jung et al.

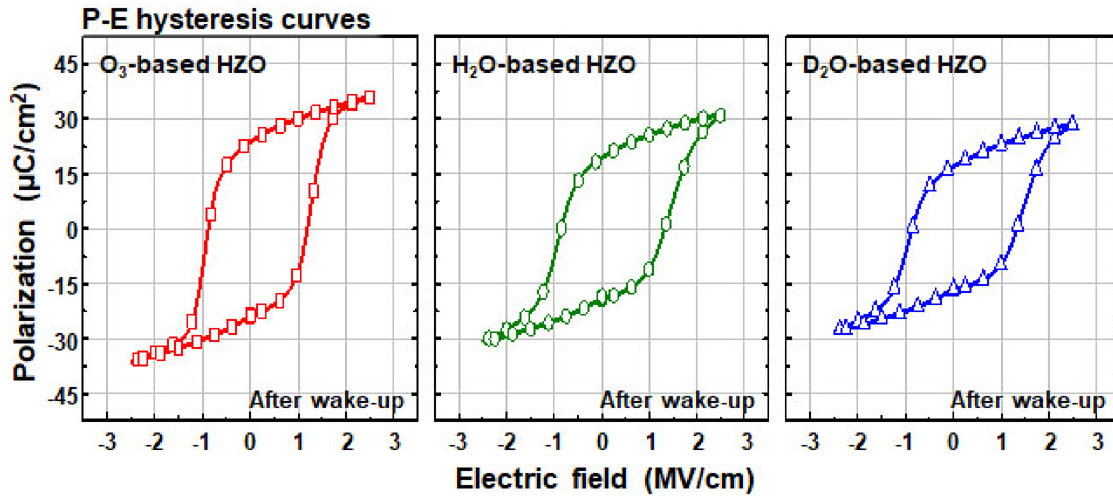

Figure 1. Polarization-electric field hysteresis curves of 10-nm-thick O_3-, H_2O-, and D_2O-based $Hf_{0.5}Zr_{0.5}O_2$ (HZO) devices annealed at 400 °C. The remnant polarization values ($2P_r$) of O_3-, H_2O-, and D_2O-based HZO devices are 47, 38, and 34 μC/cm^2, respectively.

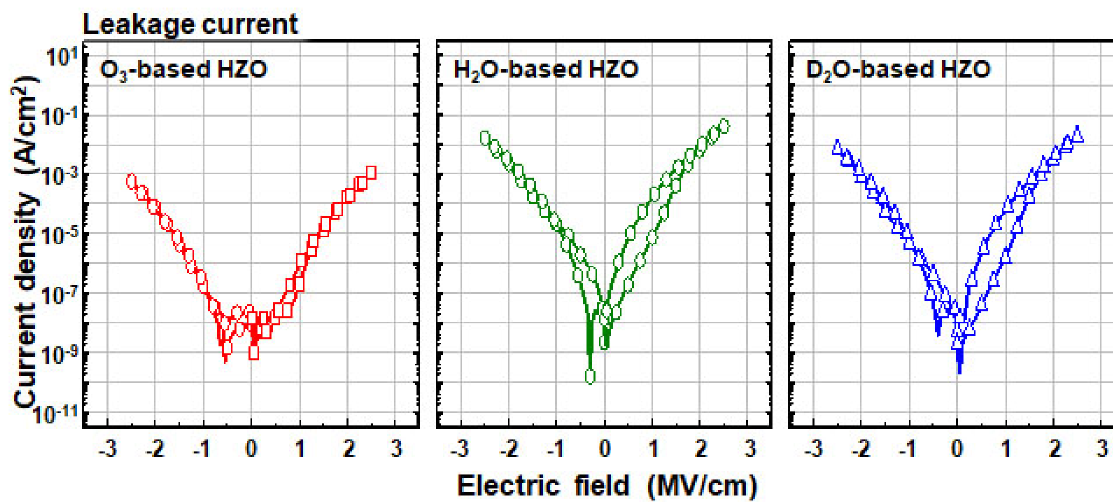

Figure 2. Leakage current density-electric field curves of 10-nm-thick O_3-, H_2O- and D_2O-based $Hf_{0.5}Zr_{0.5}O_2$ (HZO) devices annealed at 400 °C. The leakage current density values at 1MV/cm of O_3-, H_2O-, and D_2O-based HZO devices are approximately 10^{-7}, 10^{-5}, and 10^{-6} A/cm^2, respectively.