

Supplementary Information

The exchange bias behavior of BiFeO₃ nanoparticles with natural core-shell structure

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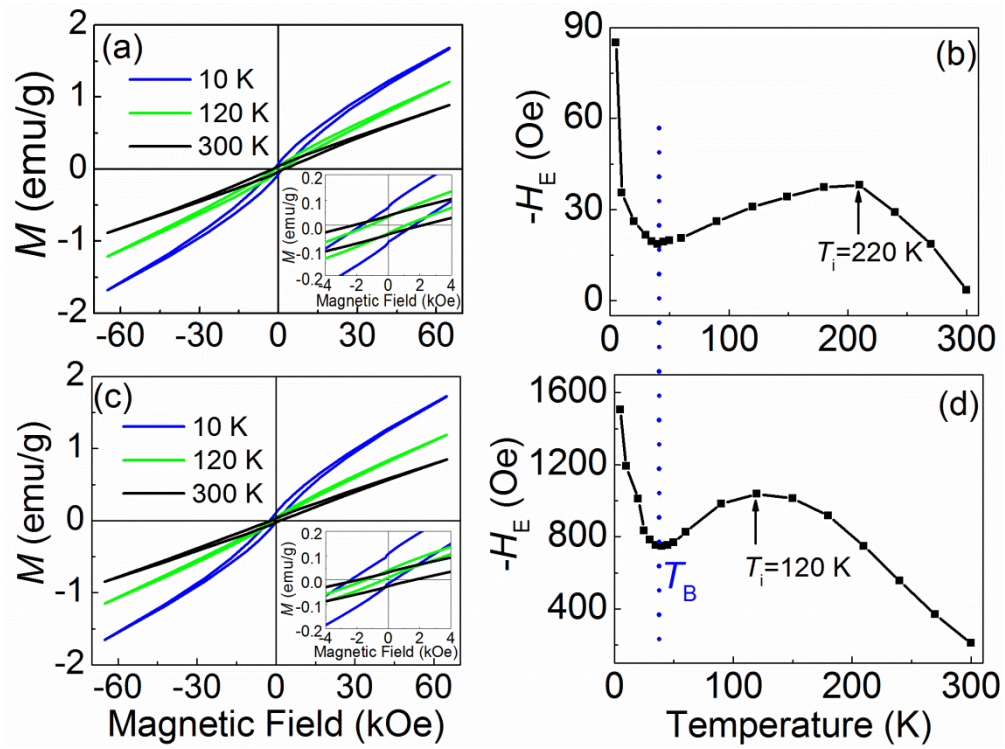


Figure S1. Magnetic measured results of 18 nm BiFeO₃ particles with maximum applied magnetic field of 65 kOe. Magnetic hysteresis (M - H) loops measured at various temperatures following (a) zero-field cooling (ZFC) and (c) 65 kOe cooling field. Temperature dependent exchange bias field ($-H_E$) under (b) ZFC and (d) 65 kOe cooling field. Insets in (a) and (c) show the local amplification of the corresponding M - H loops.

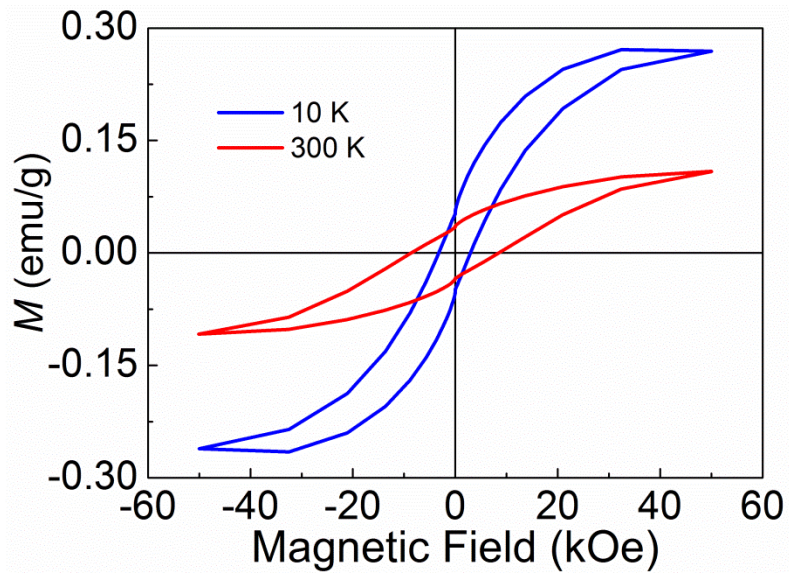


Figure S2. Ferromagnetic parts in the magnetic hysteresis curves of 18 nm BiFeO₃ particles at 10 and 300 K.

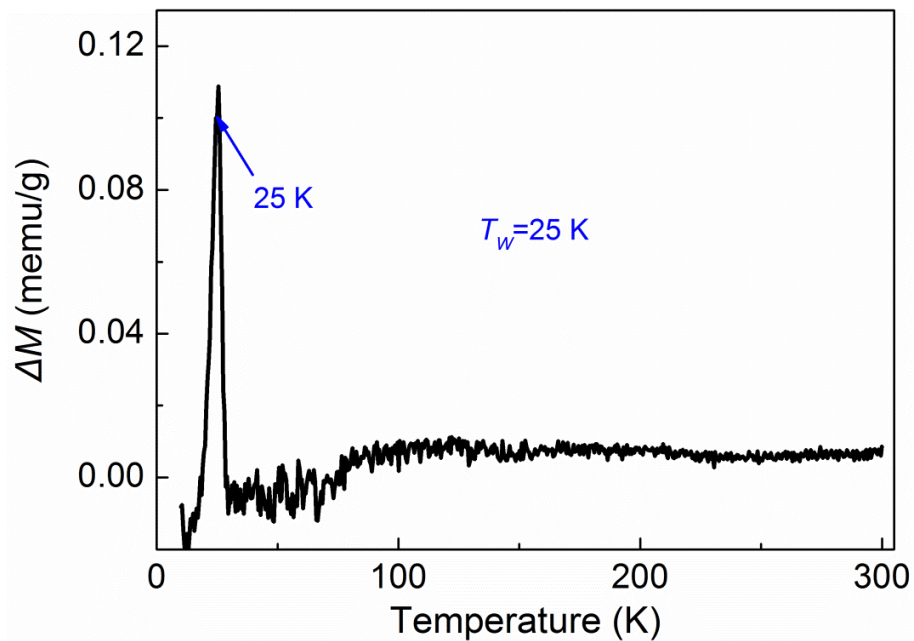


Figure S3. Magnetization difference (ΔM) between the reference and the stop-and-wait ZFC curves of 18 nm BiFeO₃ particles, where $T_w = 25$ K, and the waiting time is 4 h.

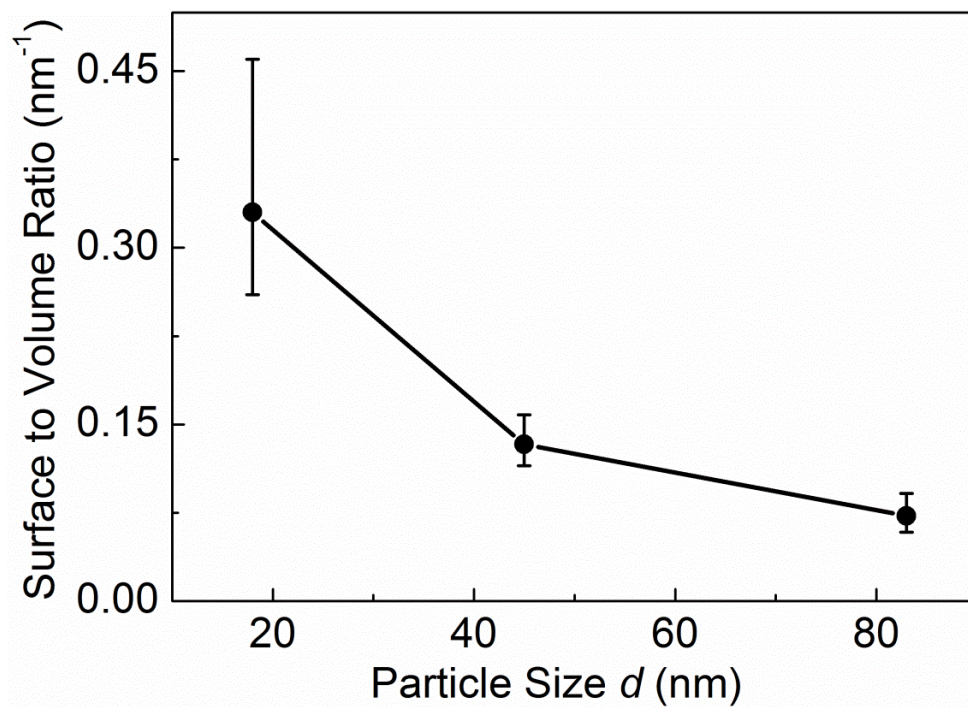


Figure S4. Surface-to-volume ratio of BiFeO₃ nanoparticles with various sizes (*d* is the diameter of the particle), which is calculated based on spheroidal particle model.