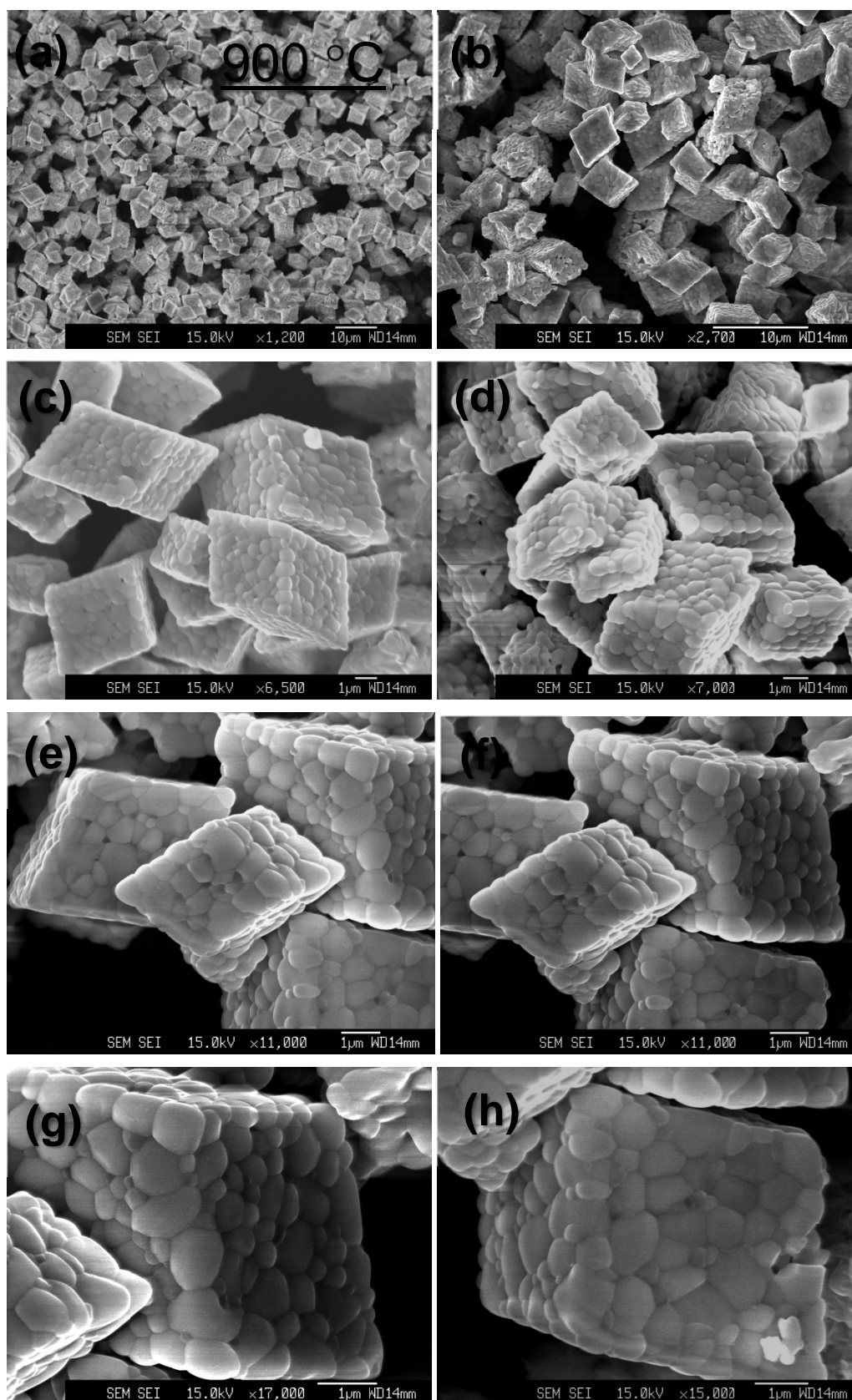


# Supporting Information

## Supporting Information

**Figure S1 (Supporting Information).** (a)-(h) SEM images of the very large  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles with surface deformations and the grains by nanoparticle sintering treatment.



## Supporting Information

**Figure S2 (Supporting Information).** (a)-(d) Plastic and surface deformation with the grains and boundaries have been evidenced in the new  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> nano-textures via high heat treatments (Sample 3). (e) The changed surface structure of a large particle with various grains and grain boundaries. (e) Model of crystal surface for SEM image of (b); (f) Model of crystal surface for SEM image of (d).

