

Effects of an Electric Current on the Superplastic Deformation Behavior of 3Y-TZP in an Oxygen-Lean Atmosphere

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Supplementary material

A schematic diagram of the apparatus used for the experiment is shown in Figure S1.

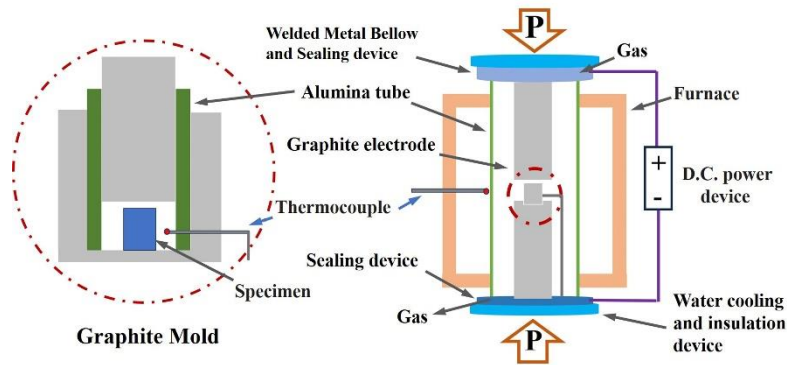


Figure S1. A schematic diagram of the apparatus used for the experiment.

Figure S2 shows the microstructure of the deformed 3Y-TZP with 5 A near the anode side ($x = 0.7$) at 1400°C, in which the cathode and anode electrodes were located at $x = 0$ and $x = 1$, respectively. The corresponding average grain size was 241 nm.

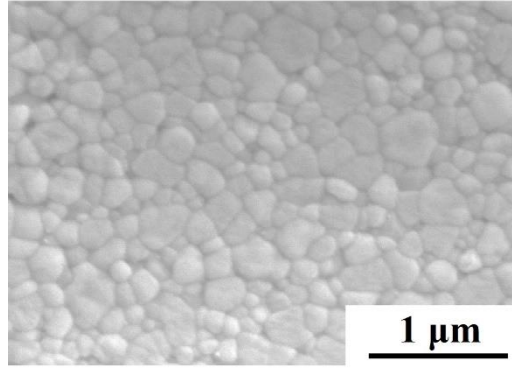


Figure S2. The microstructure of the deformed 3Y-TZP with 5 A near the anode side ($x = 0.7$) at 1400°C, in which the cathode and anode electrodes were located at $x = 0$ and $x = 1$, respectively.

The grain sizes of 3Y-TZP before and after deformation at a true strain of 0.5 and at different deformation temperatures are shown in Table S1.

Table S1. The grain sizes of 3Y-TZP before and after deformation at a true strain of 0.5 and at different deformation temperatures.

Temperature (°C)	Initial grain size (nm)	Grain size before deformation (nm)	Grain size after deformation with 0 A (nm)	Grain size after deformation with 5 A (nm)
1200 °C	125	125	159	209
1300 °C	125	136	191	265
1400 °C	125	148	218	359

The SEM observation points in the deformed specimen had a normalized distance from the cathode electrode of 0.3, in which the cathode and anode electrodes were located at $x = 0$ and $x = 1$, respectively.