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Supporting information for article:

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Supporting information

Rietveld refinement profiles of the Ce-YSZ and YSZ samples

In the following figures experimental data are represented by red points; the calculated profile is shown as a continuous black line; the continuous blue line is the difference between the experimental data and the calculated profile; green vertical bars are the Bragg positions. We note that asymmetry in peak shape was observed to varying degrees in the experimental data for Ce-YSZ and YSZ. It likely originates from a non-perfect planarity of pressed pellets compared to the highly focused and parallel incoming beam.

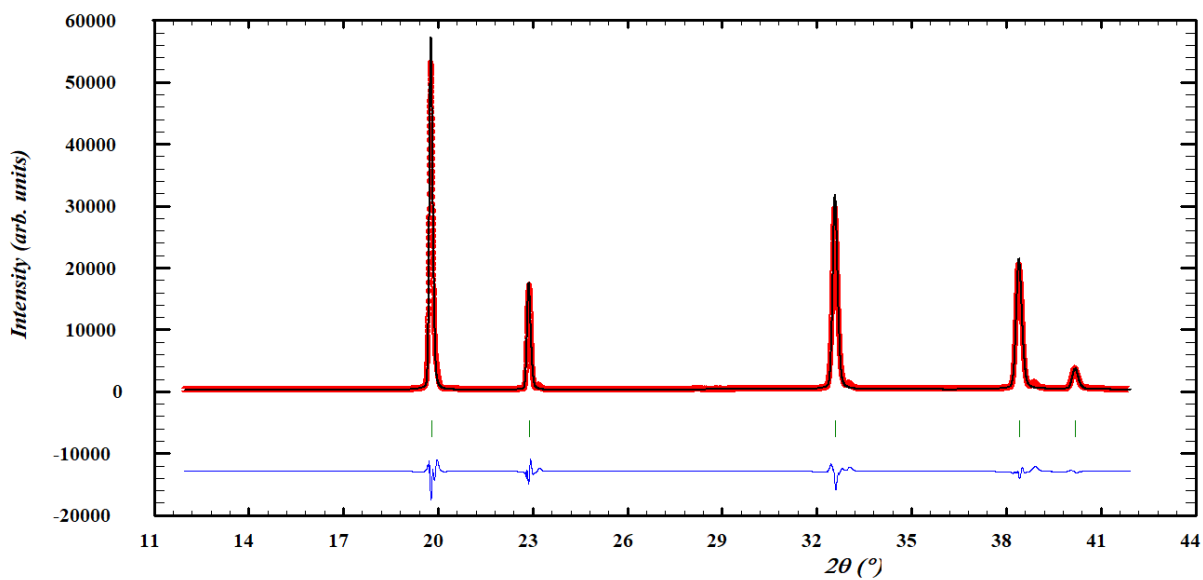


Fig. 1S. Full-profile Rietveld refinement of the irradiated $\text{Ce}_{0.18}\text{Y}_{0.15}\text{Zr}_{0.67}\text{O}_{1.93}$ - F1 sample in a Le Bail mode ($R_P = 6.6\%$).

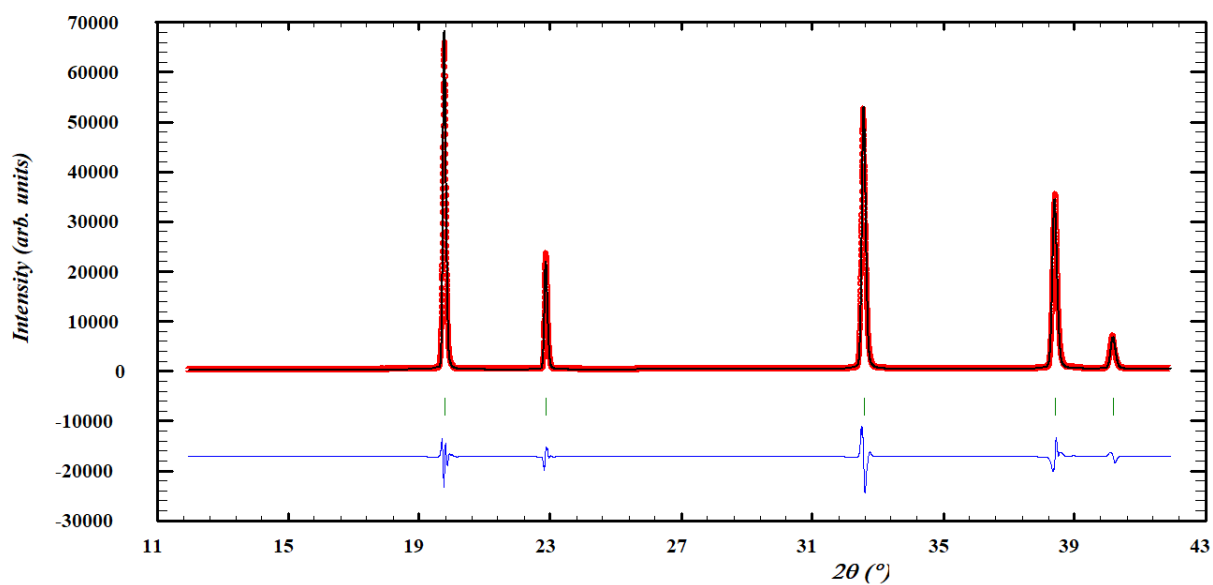


Fig. 2S. Full-profile Rietveld refinement of the irradiated $\text{Ce}_{0.18}\text{Y}_{0.20}\text{Zr}_{0.62}\text{O}_{1.90}$ - F1 sample in a Le Bail mode ($R_P = 8.6\%$).

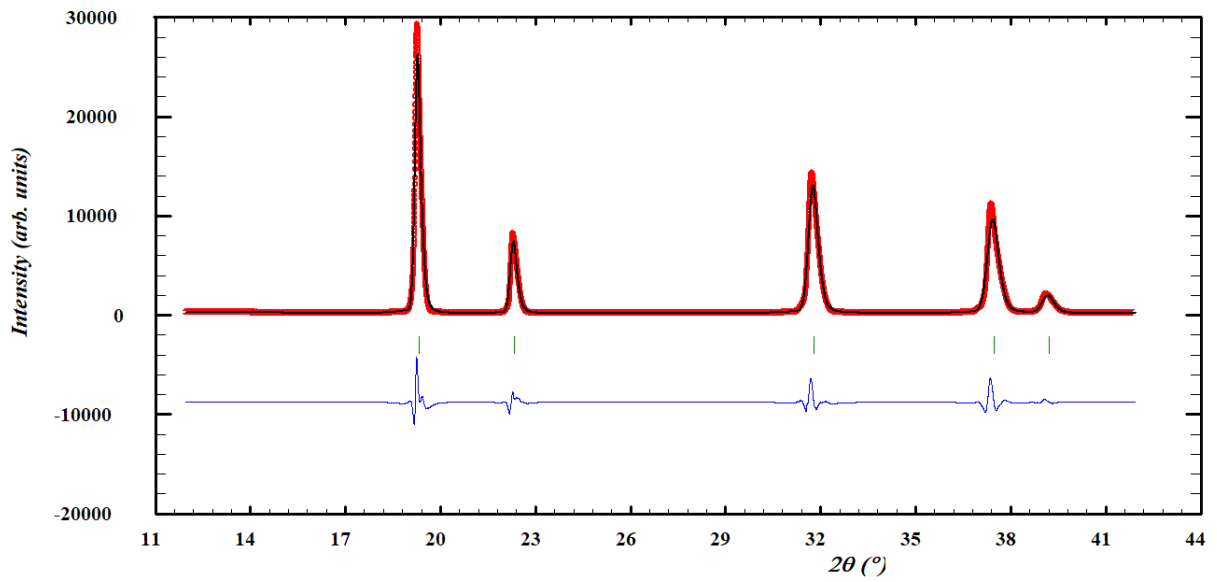


Fig. 3S. Full-profile Rietveld refinement of the irradiated $\text{Ce}_{0.58}\text{Y}_{0.15}\text{Zr}_{0.27}\text{O}_{1.93}$ – F1 sample in a Le Bail mode ($R_P = 9.3\%$).

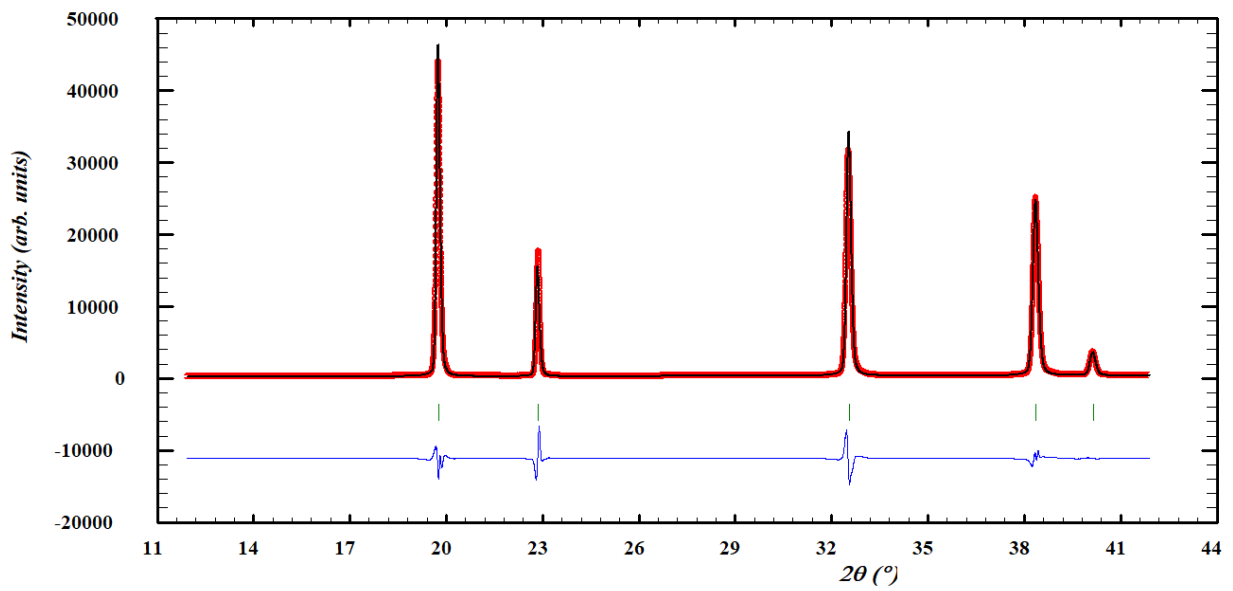


Fig. 4S. Full-profile Rietveld refinement of the irradiated $\text{Ce}_{0.18}\text{Y}_{0.15}\text{Zr}_{0.67}\text{O}_{1.93}$ – F2 sample in a Le Bail mode ($R_P = 7.8\%$).

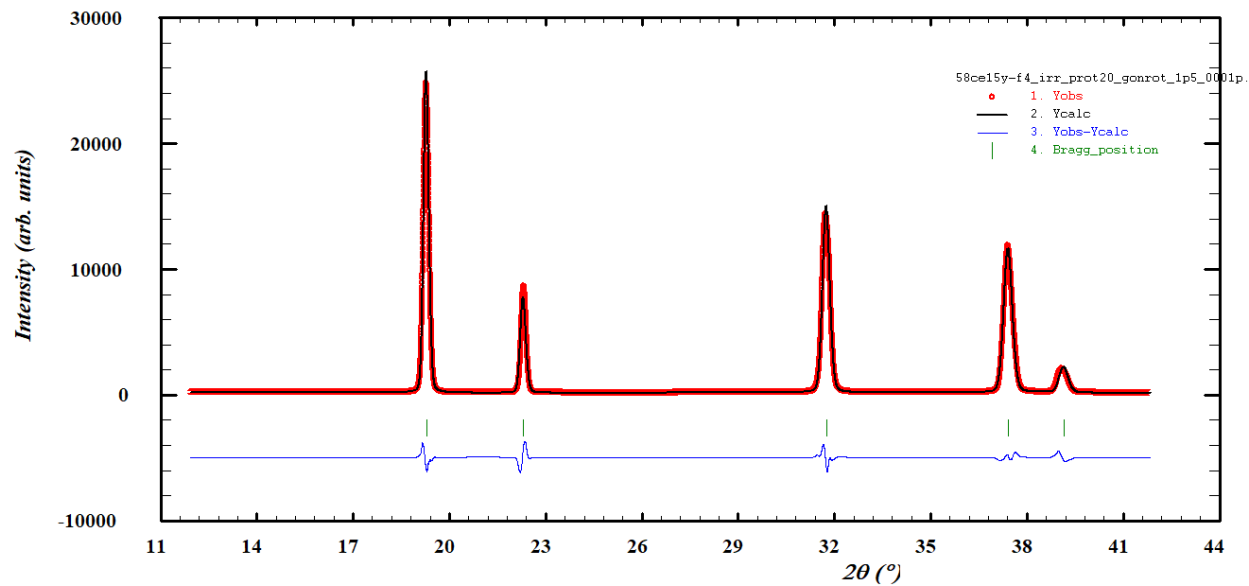


Fig. 5S. Full-profile Rietveld refinement of the irradiated $\text{Ce}_{0.58}\text{Y}_{0.15}\text{Zr}_{0.27}\text{O}_{1.93}$ – F2 sample in a Le Bail mode ($R_P = 5.5\%$).

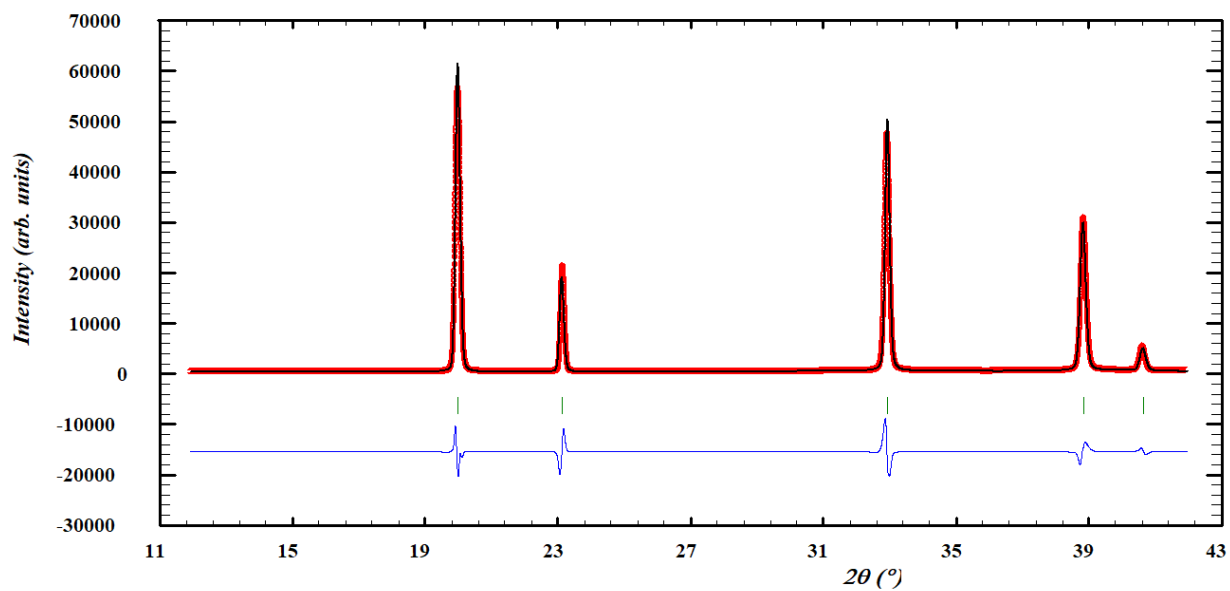


Fig. 6S. Full-profile Rietveld refinement of the irradiated YSZ – F2 sample in a Le Bail mode ($R_P = 9.4\%$).

SRIM calculations illustrating penetration depth of 14 MeV Au ions into the Ce-doped YSZ and non-doped YSZ phases

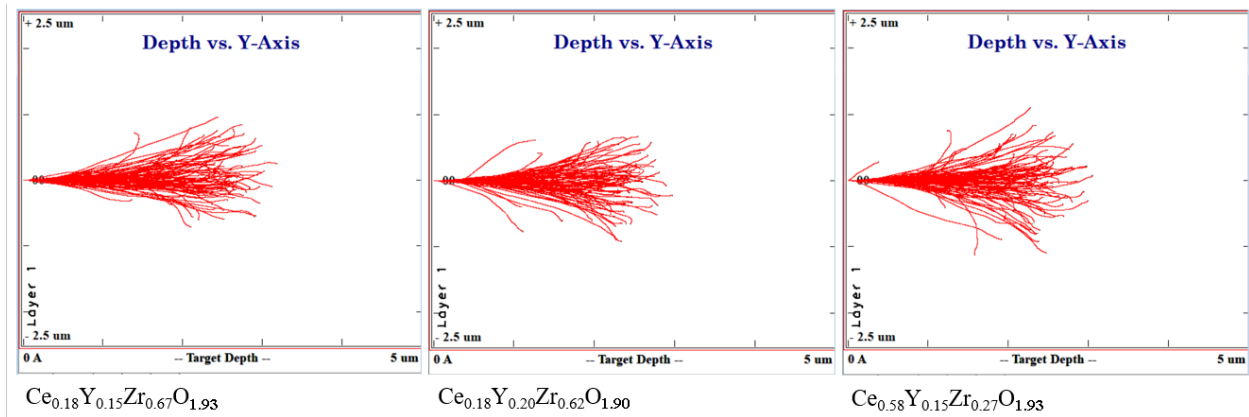


Fig. 7S. SRIM calculations illustrating penetration depth of 14 MeV Au ions into the Ce-doped YSZ phases: $Ce_{0.18}Y_{0.15}Zr_{0.67}O_{1.93}$ - left, $Ce_{0.18}Y_{0.20}Zr_{0.62}O_{1.90}$ - middle, and $Ce_{0.58}Y_{0.15}Zr_{0.27}O_{1.93}$ - right.

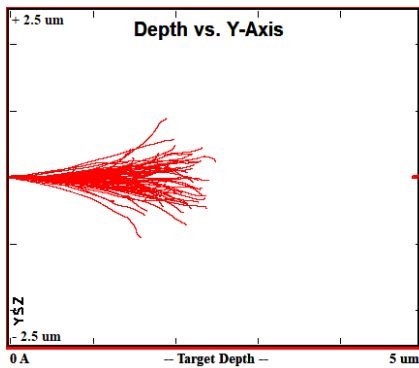


Fig. 8S. SRIM calculations illustrating penetration depth of 14 MeV Au ions into the YSZ ($Y_{0.15}Zr_{0.85}O_{1.93}$) phase