**TWENTY-THIRD ANNUAL CONFERENCE**

# YUCOMAT 2022

**&**

**TWELFTH WORLD ROUND TABLE CONFERENCE ON SINTERING**

# XII WRTCS

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# Program
## and
# the Book of Abstracts

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## Fabrication and characterization of high entropy pyrochlore ceramics

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High-entropy rare-earth (RE) zirconates with pyrochlore structure were successfully fabricated by pressureless and spark plasma sintering. $RE_2Zr_2O_7$ compound with nominal composition $(La_{0.2}Y_{0.2}Gd_{0.2}Nd_{0.2}Sm_{0.2})Zr_2O_7$ was prepared by simple glycine nitrate procedure (GNP). GNP process yielded powders with low crystallinity and after subsequent calcination, well crystalline ceramics were formed. During calcination defective fluorite (F-$RE_2Zr_2O_7$) and crystal pyrochlore (Py-$RE_2Zr_2O_7$) structures coexist. Formation of pure crystalline pyrochlore occurs after sintering at 1450 °C. High-density ceramics, free of any additives, were obtained after powders compaction and pressureless (PS), as well as Field Assisted Sintering Technique (FAST) at 1450 °C. Theoretical investigations of the high-entropy $RE_2Zr_2O_7$ pyrochlore systems were performed. Unit cell parameter of the obtained Py-$RE_2Zr_2O_7$ is 10.5892(2) Å and 10.5999(2) Å for PS and FAST sintering, respectively, which is in good agreement with the results of Density Functional Theory (DFT) calculations. The thermal diffusivity of sintered samples at room temperature was ~0.7 $mm^2/s$ for both sintering methods.