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The flux growth of magnesium silicate perovskite single crystals

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ABSTRACT

We present a flux-growth method for growing large, strain- and inclusion-free single crystals of perovskite-type $(Mg,Fe,Al)(Si,Al)O_3$ in a multi-anvil apparatus. Molten NaCl is used as the flux and the temperature is cycled at ~25 GPa to enhance grain growth. In this way, we have synthesized high-quality subhedral perovskite crystals in excess of 300 micrometers of pure Mg, or Fe- and Al-bearing compositions with minimal Na-contamination from the flux. Single-crystal structure refinement of the $MgSiO_3$-perovskite demonstrates the quality of the crystals.