

## Formation and Crystallization of Metastable Phases by Containerless Processing

システムデザイン研究科航空宇宙システム工学専修 博士後期課程2年  
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### <概要>

1. Containerless processing is a promising technique to produce the new functional materials.
2. A Metastable phases does not exists under equilibrium conditions.
3. To produce new functional materials, here we used gas jet levitation because it provides non-equilibrium system.
4. For the Lu-Fe-O system, controlling of oxygen partial pressure is most important because  $\text{Fe}^{3+}$  will change to  $\text{Fe}^{2+}$  in the reduced oxygen atmosphere.
5. Oxygen partial pressure was measured by the  $\text{ZrO}_2$  oxygen sensor
6. The formation metastable phases was confirmed through characterization
7. Magnetic properties of the new materials produced by undercooled  $\text{REFeO}_3$  melt was studied.

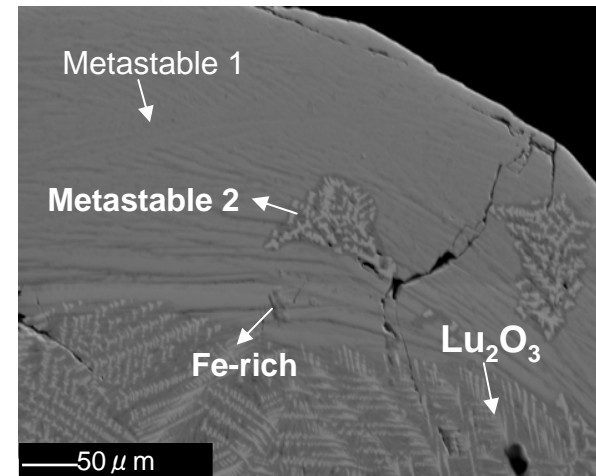


Fig. The sample processed under reduced oxygen partial pressure Confirms the formation of new metastable phases in the Lu-Fe-O system