Project: Partitioning of REE and CM between crystals melts, and fluids and in situ XAS studies of metal transport

Position Overview: The Centre in Critical Resources for the Future (CCRF) is offering a PhD scholarship in partnership with the Australian National University (ANU). This opportunity is ideal for a highly motivated graduate interested in experimental investigations of the magmatic-hydrothermal transition in carbonatites and the factors controlling REE and CM enrichment.

Project Description:

This project will provide an understanding of the nature of the fluids and melts and how they transport REE and other critical metals. Partitioning of REE and CM between crystals and melts or fluids combined with synchrotron-based studies of metal transport will provide basic information helpful to understanding the concentration of REE by hydrothermal or brine melt related process in carbonatite systems. The candidate will determine the controls on the partitioning of rare earth and other critical metals between minerals and melts and fluids in evolving carbonatite systems, and how those metals are transported in those melts and fluids. They will use techniques of high-pressure experimental petrology, including in situ XAS studies of metal transport, combined with cutting edge microanalytical approaches to characterisation of experimental run products.

This research will help us understand how REE deposits associated with carbonatite systems can be upgraded to economic levels of enrichment. The understanding gained will be of benefit to exploration geologists seeking to understand mineralisation in these enigmatic systems.

Your Role: As a PhD candidate, you will have the unique opportunity to work under the guidance of leading experts:

- Prof Andrew Berry– Primary Supervisor
- Professor Greg Yaxley
- Professor John Mavrogenes

Industry Collaboration: You may spend 12 months embedded with one or more of our esteemed industry partners: