

## **Thermophysical Properties of Molten Metal Oxides**

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Molten metal oxides are ubiquitous in nature and in materials production – magmas, metallurgical slags and the high purity oxide liquids used to make functional glasses. This research is focused on understanding the behavior of fragile oxide liquids that can be made into glass by rapid cooling of molten drops. Density, thermal expansion coefficient, surface tension and viscosity are reported for equilibrium and supercooled liquids of selected titanate, aluminate and silicate materials. Measurements were made using the Japanese Aerospace Exploration Agency Electrostatic Levitation Furnace (ELF) on the International Space Station. These microgravity experiments using containerless techniques enable measurements by establishing controlled oscillations in otherwise quiescent drops. Recovered samples were studied on Earth by a variety of methods, and glasses made in space were compared to those made on Earth. The work will be presented in the context of developing new glass products, mainly for commercially valuable optical and device applications.