

Nayeem, Rifkhan Mohammed, Dalhousie University, Halifax, Nova Scotia, Canada for his project: *Experimental Study on Perovskite Dissolution for Improving REE Recovery from Kimberlite Tailings*.

Rifkhan Nayeem is a final-year PhD candidate in the Department of Earth and Environmental Sciences at Dalhousie University, working under the supervision of Dr. Yana Fedortchouk. His research focuses on understanding the behaviour of rare earth elements (REE) in kimberlite tailings and developing sustainable approaches for their recovery.

Rifkhan investigated kimberlite cores and tailings from the Snap Lake Mine (Canada) and Voorspoed Mine (South Africa), providing new insights into the stability and alteration behaviour of perovskite (CaTiO_3), the primary REE-bearing mineral in kimberlite. His research demonstrated that perovskite can become unstable under post-emplacement alteration conditions, resulting in REE redistribution and the formation of secondary minerals.

Currently, Rifkhan is conducting experimental studies to determine the dissolution kinetics of perovskite and its transformation into anatase (TiO_2) during hydrothermal alteration. This research has important implications for improving REE recovery from kimberlite tailings and evaluating their potential role in CO_2 sequestration.

With support from the Lipman Research Award, Rifkhan will perform advanced analytical investigations using X-ray Photoelectron Spectroscopy (XPS) and Inductively Coupled Plasma–Optical Emission Spectroscopy (ICP-OES) to advance his experimental studies and improve understanding of mineral dissolution mechanisms.

Rifkhan is originally from Sri Lanka, where he earned his Bachelor's degree in Mineral Resources and Technology from Uva Wellassa University and his Master's degree in Earth Sciences from the University of Peradeniya. Before starting his PhD, he worked for four years as a researcher at the Gem and Jewellery Research and Training Institute of Sri Lanka. He also serves as Secretary of the Dawson Graduate Student Society and the Society of Economic Geologists Student Chapter at Dalhousie University.

