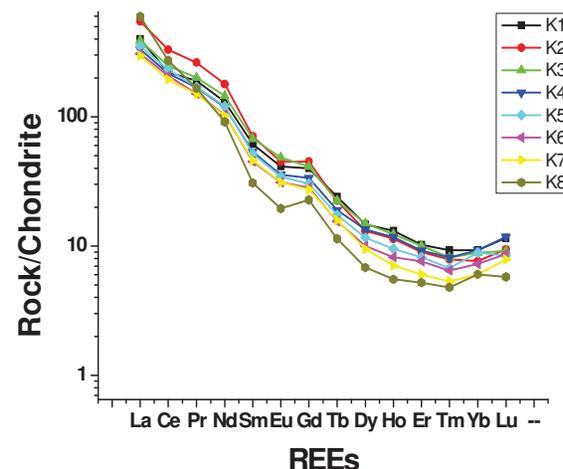


Determination of rare earth elements in Indian kimberlite using inductively coupled plasma mass spectrometer (ICP-MS)

A method has been developed for the analysis of rare earth elements (REEs) in kimberlite samples using inductively coupled plasma mass spectrometer (ICP-MS). The samples were dissolved using sodium peroxide fusion and after appropriate dilutions the solutions were analyzed using ICP-MS. The paper presents the concentration of rare-earth elements as determined by ICP-MS in eight kimberlite samples from Central India. The method was validated using certified reference materials STSD-1 and STSD-2 from Canadian Certified Reference Material Project. The method detection limit of various REEs varies from 0.12 to 1.54 mg kg⁻¹. The total REE concentrations range from 418 to 726 mg kg⁻¹ and fall within the interval of those reported in the literature for kimberlites. Despite the marked difference in the REE contents, all the analyzed samples show similar REE patterns that resemble those for kimberlites. In order to compare ICP-MS results, the samples were analyzed using instrumental neutron activation analysis which is a reference method for determination of REEs in geological samples.

Chondrite normalized REE patterns for K-1 to K-8 using results obtained by ICP-MS



Detection limits obtained using sodium peroxide fusion

Elements	Analytical mass	Detection limit (mg kg ⁻¹)	Elements	Analytical mass	Detection limit (mg kg ⁻¹)
Y	89	0.25	Tb	159	0.15
La	139	1.54	Dy	163	0.12
Ce	140	1.35	Ho	165	0.30
Pr	141	0.32	Er	166	0.13
Nd	146	1.15	Tm	169	0.12
Sm	147	1.03	Yb	172	0.14
Eu	151	0.35	Lu	175	0.13
Gd	157	0.20			

Detection limits were calculated as the analyte concentration equivalent to three times the standard deviation of the ion counts obtained for the sample blank.