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## National Facility for Electron Probe Micro-Analysis (NAFEPMA)



JEOL JSM-6490 SEM



CAMECA SX-100 EPMA

The Department of Geology and Geophysics has an electron probe micro analyzer (EPMA), successfully running since December, 2008 as a DST-IIT Kharagpur National Facility. The facility developed under the intensification of research on high priority areas (IRHPA) program of DST also consists of an ancillary SEM lab. The primary objective of the national facility is to provide high quality compositional information from micron-sized domains required in materials research with a focus on applications in mineralogy, petrology and ore geology.

The SEM is equipped with a Peltier-cooled EDS detector for obtaining semi-quantitative chemical analysis in addition to high magnification imaging using back scattered electrons (BSE), secondary electrons (SE) and cathodoluminescence (CL). The EPMA is capable of measuring concentrations as low as 1000 ppm of all elements between boron and uranium in the periodic table. Wide varieties of materials including minerals and rocks, alloys, ceramics and polymers have been analyzed by a spectrum of users covering the academia and industry as well as various national laboratories from all over the country. Within the institute, apart from users from the department, students and faculty members from other departments such as metallurgy, mechanical and civil engineering have been frequent users of the facility. In the last 8 years, 12 Ph.D. theses with a strong dependence on EPMA data have been produced in the department, apart from several M.Sc. and M.Tech. dissertations. Over 15 more Ph.D. scholars are presently working on problems with major EPMA-centric research components. In addition to performing high quality micro-beam chemical analyses, the facility has pioneered within the country in the development of specialized protocols for U-Th-Pb<sub>total</sub> dating of geological events using monazite, uraninite, xenotime and produced trained manpower in using EPMA.

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