

Efforts have been made to use this electrochemical technique by designing instruments. It has been recently demonstrated that partial extraction of metals by electrolysis (PEXMEL) could be effectively used for direct detection of polymetallic sulphides. India has fabricated a low powered, less expensive instrument. As the results obtained are encouraging, this method could prove useful in a wide variety of geological terrains (viz. tropical, sub-tropical and glacial overburden). Further, application of this method in lateritic or in arid terrain may establish whether targets could be identified under such covers, as conventional methods are unsuitable.

A new tool available in diamond exploration is the Ni thermometer which is used to evaluate the diamond grade of the host rock- kimberlite or lamproite. The thermometer uses proton microprobe for the analysis of trace elements in garnet grains.

### *Geophysical Surveys*

Airborne geophysical surveys have been carried over some selected blocks in the country and high altitude aeromagnetic surveys have covered the southern part of the Precambrian shield. A regional aeromagnetic survey programme (NASM - National Aeromagnetic Survey Mission) to cover the entire country (except Himalayan and Deccan Trap terrain) is in progress. The purpose is to prepare a regional magnetic (total intensity) map of the entire country to elucidate the litho-structural fabric. The surveys are conducted at barometric height of 1500 m/1800 m/2100 m along lines spaced at 4 km interval. **This high level altitude survey is not very useful in mineral targeting.**

Apart from the multi-sensor air-borne surveys carried out in selected parts of mineralised belts in Rajasthan, Andhra Pradesh and Bihar-West Bengal during 1967-68 (under Operation Hard Rock) and parts of Rajasthan-Gujarat-Madhya Pradesh, Karnataka and Maharashtra during 1971-72 (BRGM/CGG), **surveys (EM, magnetic and spectrometric) with a Twin Otter aircraft acquired by GSI are in progress (from 1986-87) in selected areas of Tamil Nadu, Andhra Pradesh, Maharashtra, Orissa, Haryana and Rajasthan are for locating targets for mineral exploration and refining of the existing geological maps.** Multi-sensor airborne surveys yield a wealth of data which could be utilised for exploration of base, precious metals and rare earth metals which are associated with radio-active minerals amenable for detection by aero-radiometric techniques.

What is now required is the use of high quality, low-level aeromagnetic surveys to aid in mineral discovery and refinement of geological maps. **Countries with mature exploration programmes (e.g. Australia and Canada) have excellent coverage by low-level (300 m altitude) closely spaced (1 km or less) high quality aeromagnetic surveys. Such mineral oriented surveys, help to create a good data base for exploration.**