**Rapid (3 hours) initial analysis of volcanic rocks by SEM/EDS techniques.**

 Upon arrival to the lab the following instruments are turned on:

1. Drying oven set to about 120 °C.

2. Electric furnance se to 1200 °C.

3. Hitachi TM3000 instrument turned on (warming up of turbo-pump).

4. Graphite coating machine turned on (warming up of turbo-pump).

5. Calibration spreadsheet for EDS analysis is activated.

Upon arrival of the rock samples the following operations are performed:

(15 minutes)

Part of the sample is coarse-crushed. The rock piece is placed in a plastic bag and placed on a steel plate. The rock is crushed with a hammer into millimeter-scale particles.

A part of the crushed rock is set aside for bulk-analysis.

(15 minutes – while the sample is melting go to next step)

The sample for bulk analysis is finely ground in a mortar and some 100 mg are placed in graphite crucible and melted in the electric furnace for 20 minutes. After melting the glass-bead is quenched in water and placed in the drying oven for few minutes. The glass-bead is taken out and the temperature set to 70 °C.

(30 minutes)

The sample is then run through 2 mm, 1 mm and 0.5 mm sieves. All fractions investigated under a binocular and few species of all encountered minerals and eventual glass are picked up. Finally the finest fraction is processed with hand magnet to extract magnetic minerals.

(60 minutes)

All mineral species and the glass bead are fixed on a circular microscope slide by RAPID epoxy resin by placing the slide in the drying oven at 70°C for some 10 minutes. After cooling the slide surface is ground to flatness and polished by hand on 400 – 800 and 2000 grit paper. Finally the slide is polished for 5-10 minutes on 6 micron diamond grit on a rotating wheel.

After washing with propanol-acetone mixture the slide is carbon coated and placed in the SEM.

(15 minutes)

The SEM/EDS session starts with EDS-analysis of the glass that represents the bulk rock.

Its major element composition may be reported after some 15 minutes.

(60 minutes)

The SEM/EDS session continues with mineral analysis that may be finished within an hour.