MARSHALL UNIVERSITY GEOLOGY DEPARTMENT RESEARCH EQUIPMENT

SAMPLE PREPARATION/ MINERAL SEPARATION

Spex Mill with tungsten carbide and agate balls for grinding rock samples

OTHER EQUIPMENT (SAMPLE PREPARATION)

- Rock crushing equipment
- Rock saws
- Rock grinding and polishing equipment
- Sieves; shaker
- Agate mortars and pestles

- Frantz Isodynamic separator
- Heavy liquids

+ separatory funnels

- Centrifuges; micro-filtration capabilities

MINERAL IDENTIFICATION

Three Research grade polarizing microscopes (Nikon Optiphot; Nikon 50i – POL; Meiji MT9900) with epi-illuminators for reflected light microscopy.

General Electric X-ray diffractometer (XRD-9000 Z-80/ XRD-6VS) & XRF Spectrometer (1960’s model upgraded in 1986).

CHEMICAL ANALYSIS

I- Scanning electron microscope

Capable of:

- *imaging at magnifications up to 200,000 X.*
- *Qualitative analysis for all elements with atomic number higher than 8*
- *Quantitative analysis of spots in solids as small as 2 μm*

JSM-5310LV SEM with an Oxford Instruments EDS detector, and ISIS 300 software

CHEMICAL ANALYSIS

II- Varian Liberty 110 Inductively Couples Atomic Emission Spectroscope (ICP-OES)

Capabilities:

Useful for analysis of dilute solutions

Elements (mostly metallic) are detected at the parts per million level (ppm).

CHEMICAL ANALYSIS

III- Varian Spectra AA 600 Zeeman Graphite Furnace Atomic Absorption Spectrometer (GF-AAS)

Useful for the analysis of dilute aqueous solutions

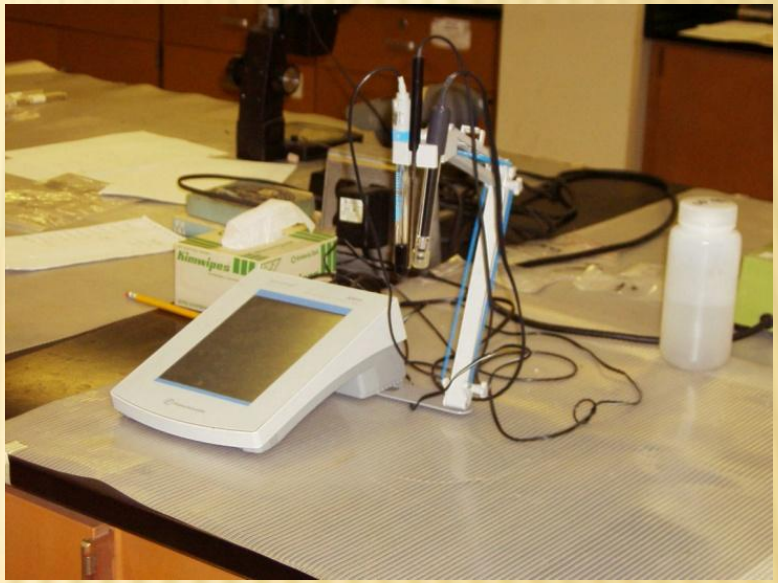
Concentrations of cations detected at the part per billion (ppb) level .

CHEMICAL ANALYSIS

IV- Other equipment

- Digital Titrators

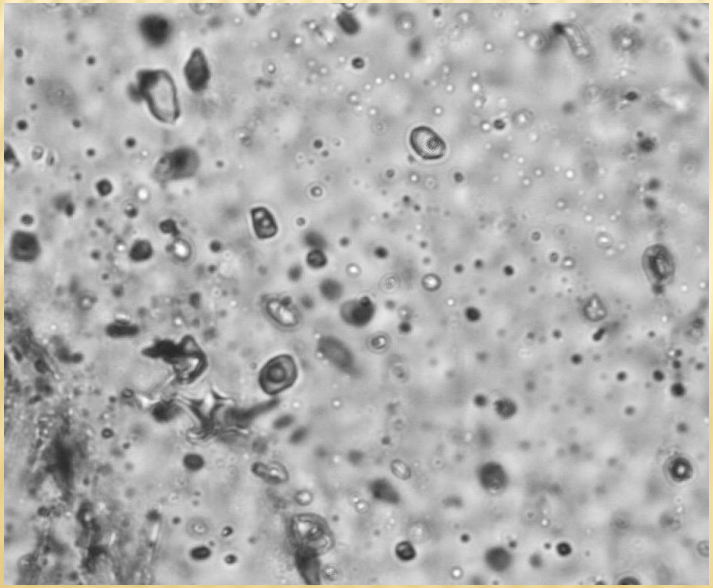
- pH and conductivity meter



Acumet AR-50 pH and conductivity meter

FLUIDS IN MINERALS

Linkam THMS G600 heating – freezing stage for microthermometric studies of fluid inclusions in minerals



OTHER CAPABILITIES

The department also has access to:

- Hach Spectrophotometers
- Atomic Force Microscopy
- Transmission Electron microscopy
- Confocal Microscopy
- 3-D laser surface mapper