

## SOME DEVELOPMENT AND IMPROVEMENT OF ED XRF TECHNIQUES IN MONGOLIA

Sh. Gerbish, J. Bayarmaa

*Nuclear Research Center, National University of Mongolia,*

The Nuclear Research Center, National University of Mongolia, Ulaanbaatar has got three ED XRF systems with isotopic sources (Fe-55, Cd-109, Am-241, Co-57) from 1976, secondary target from 1981 and total reflection X-ray techniques from 1993. This facility is used for training, research and analytical services.

Training is provided for students of Physics and Chemistry at both Undergraduate and Postgraduate levels. Samples analyzed are of environmental, geological, biological and steel and alloy materials.

Research activities are carried out in areas of mineral resources and environmental studies (air, water, biological and geological materials) and optimization of measurement protocols.

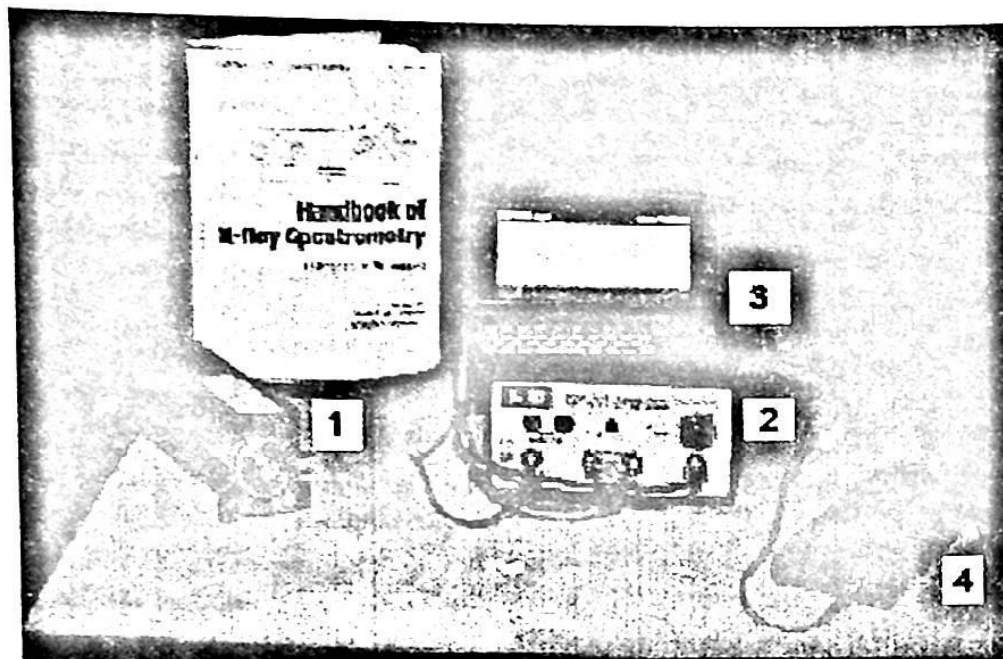
The Radioisotope ED XRF system is used since 1976 for determination of major and minor elements of copper-molybdenum and polymetallic ore samples, analysis for improvement of mineral resources. The Cu-Mo ores' and tail's samples are analyzed along with major contents such as Cr, Mn, Fe, Cu, Zn, As, Pb, Zr, Mo and the Cu and Mo concentrates, using 20 mCi Cd-109 source. The Cu and Mo concentrates are analyzed for determination minor toxic elements toxic As, Sb and important Ag elements using 20 mCi Am-241 source [1,2, 3].

The TXRF system is used since 1993 for determination toxic heavy (Ti, Cr, Mn, Fe, Cu, Zn, As, Pb, Cd, Hg and so.) metals and some trace elements in water, alcohol, products of fermentation and food samples. This technique is used for environmental studies and monitoring analysis[4].

Analytical services are provided for research institutions, universities, governmental agencies, geological and environmental assessment companies, prospectors and miners. Other analytical services include determination of trace elements in soil, sediment and rock samples.

Also the XRF group has participated in different projects, which organized by the IAEA. Under the CRP "In-Situ Applications of X-Ray Fluorescence Techniques" has got a portable XRF analyzer. This system consist of Si-PIN detector XR-100T and pocket MCA 8000 (Amptek). It will be used for certification analysis of Buddha statue of

Budda monastry orpogode, works of art and archaeological objects [5]. Natural size of this portable XRF system is shown in Fig.1.



*Figure 1. A portable XRF System, which has created in NRC, NUM in 2002.*

1. – Si-PIN detector, with radioactive source assembly
2. – power supply XR-100T
3. – Desk top computer
4. – Porket MCA 8000 (Amptek)

3 SEP (single element probe) and 7 MEP (multi-element probe) in-stream analyzers from Thermo Gamma Metrics, Adelaide, SA are installed in February 2001 and now operated successful in technological monitoring process of the Cu-Mo ore processing plant Erdenet. It will be extended next years up to 11 MEP. This MEP systems are based on Si(Li) detectors and Cu-Mo ores', tail's, Cooper and Molybdenum concentrates' samples will be analyzed [5].

From this year another 2 XRF groups (Central Geological Laboratory and Central laboratory of Science and Technological Technical University) are working in Mongolia, Ulaanbaatar for application ED XRF systems in the geological studies.

References.

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