

**EFFECT OF GRAIN SIZE ON WAVELENGTH DISPERSIVE X-RAY
FLUORESCENCE SPECTROMETER ANALYSIS OF CHLORITE-
BIOTITE-SCHIST SAMPLES FROM NARWAPAHAR,
SINGHBHUM DISTRICT, JHARKHAND, INDIA**

V. Madakkaruppan*, Chanchal Sarbajna and S.Nayak
*Atomic Mineral Directorate for Exploration and Research,
Begumpet, Hyderabad
E-mail: karuppanmv@gmail.com*

Abstract

Major, minor and selected trace elements analysis on uraniferous chlorite-biotite-schist samples from Narwapahar, Singhbhum district, Jharkhand, was carried out using Wavelength Dispersive X-ray Fluorescence Spectrometer (WDXRFS) by adopting powder pellet sample preparation technique. The major minerals present in this ore are chlorite, biotite, quartz and muscovite. Uraninite is the chief uranium mineral and the other accessory minerals include albite, epidote, pyrite, chalcopyrite, ilmenite, rutile, magnetite and monazite. Muscovite, biotite and chlorite, which have a flaky type of morphology exhibit preferred orientation along the surface of the sample, during sample grinding, which leads to erroneous results by WDXRFS. In the present study, the samples are ground to four different grain size fractions: <38 μm (-400#), 38- 44 μm (+400 to -325#), 44 - 75 μm (+325 to -200#), and 75-106 μm (+200 to -150#) to study the effect of grain size on analysis. The results indicate that concentration of some of the trace elements such as Cr, Ni, Cu, Pb and U improved as the grain size decreased from 106 μm (150#) to 38 μm (400#). The studies suggest that the optimum grain size of <38 μm is ideal for precise and accurate analysis. The observation substantiates that minor accessory ore minerals get liberated at fine size and the sample becomes more homogeneous.

Keywords: X-ray fluorescence spectrometry, WDXRFS, Chlorite-biotite-schist, Grain size, Major, Minor and Trace elements, Singhbhum.

**Corresponding author*