

WAVELENGTH – DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRIC DETERMINATION OF GERMANIUM IN CARBONACEOUS MATTER OF ROCKS

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Abstract

The carbonaceous matter of rocks is known to contain significant amounts of germanium. The paper proposes a simple, accurate, precise, rapid, and non – destructive wavelength – dispersive x-ray fluorescence spectrometric technique for determining germanium in the carbonaceous matter of rocks. The technique uses a sequential x-ray fluorescence spectrometer, 100 kV – 80 mA – 3 kW x-ray generator, silver x-ray tube, LiF 220 analysing crystal, fine (150 µm) collimator, air path, scintillation counter, and short counting times.

The accuracy of the technique is excellent (within 1 percent). The precision is also excellent (within 2 percent). The lower limit of detection is 2 ppm. The time taken for determining germanium in a batch of twentyfour samples of carbonaceous matter of rocks, for a replication of four analyses per sample, by one operator, using a manual wavelength – dispersive x- ray fluorescence spectrometer, is only eight hours.

Keywords: X-ray Fluorescence Spectrometry, WDXRFS, Germanium, Carbonaceous Matter of Rocks.