

ANALYTICAL AND BIOGEOCHEMICAL  
STUDIES OF TRACE HEAVY METAL  
IONS IN LOCAL INDUSTRIAL  
MINERALS.

Presented by

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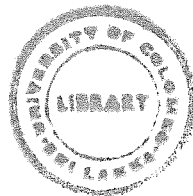
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## ABSTRACT

A programme has been initiated to utilize biogeochemistry for mineral prospecting. A preliminary investigation of a plant - soil relationship was carried out in copper-magnetite deposit at Seruwila, Sri Lanka. Levels of copper, zinc, cobalt and nickel have been determined using atomic absorption spectrophotometry.

The need to develop sensitive and selective analytical procedures to determine molybdenum, vanadium, tungsten, zirconium, thorium and lanthanum is important, as the use of flame atomic absorption spectrophotometry is not sensitive enough.

N - Phenylbenzohydroxamic acid (NPBHA) was prepared using a previous procedure. NPBHA forms colourless complexes with molybdenum (VI), tungsten (VI), zirconium (IV), thorium (IV), lanthanum (III) and a violet coloured complex with vanadium (V). In the presence of phenylfluorone (PF) these complexes form mixed ligand complexes which are coloured. Hence, solvent extraction and spectrophotometric studies of these elements were performed.

Two extractions are involved, for the methods developed for vanadium (V), molybdenum (VI) and tungsten (VI). It is impossible to determine vanadium (V) in the presence of molybdenum (VI) and tungsten (VI). The interference

from vanadium (V) can be eliminated in the determination of molybdenum (VI) and tungsten (VI). Only tungsten (VI) interferes in the determination of molybdenum (VI), whereas molybdenum (VI) and titanium (IV) interfere for the method developed for tungsten (VI). The continuous variation plots for <sup>the</sup> molybdenum (VI) system show that the possible structure of the complex is  $\text{Mo(VI).2NPBHA -PF}$ .

The proposed mixed ligand systems for the determination of zirconium (IV), thorium (IV) and lanthanum (III) involve similar procedures. The presence of thiocyanate was found to enhance the sensitivity of the method proposed for zirconium (IV).