SEPARATION OF IRON/III/ FROM MANGANESE/II/ IN BASALTS BY SOLVENT EXTRACTION

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The separation of iron/III/ from manganese/II/ by solvent extraction from hydrochloric acid to the chloroform solution of acetylacetone was applied to the analysis of basalts. The results after single and double separation of iron/III/ from manganese/II/ in basalts are presented.

INTRODUCTION

Several reagents have been suggested for the solvent extraction separation of iron from manganese. The use of acetylacetone is interesting for its high concentration capacity. McKaveney and Freiser used acetylacetone in chloroform for the extraction of iron/III/, manganese/II/ and other elements from $H_2SO_4$ solutions. A 1:1 acetylacetone:chloroform volume ratio was chosen because this
mixture was as effective as acetylacetone and has the advantage that its density is higher than one.

In this paper the extraction system was investigated which enables to separate from basalt samples milligram amounts of iron from microgram amounts of manganese.

**EXPERIMENTAL**

**Materials and procedure**

All chemicals used were of analytical reagent grade. The radionuclides $^{54}\text{Mn}$, $^{99}\text{Fe}$ used were of commercial radiochemical purity /ÚVVVR, Czechoslovakia/.

Extractions were performed with 8 cm$^3$ of aqueous phase which contained 4-60 mg of iron/III/ as FeCl$_3$·6H$_2$O and microamounts of manganese/II/ as MnCl$_2$·4H$_2$O. The same volume of organic phase was used which consisted of 4 cm$^3$ of acetylacetone in chloroform. Both phases were shaken at room temperature. After equilibration 2 cm$^3$ aliquots of each phase were measured by a NaI/Tl/ scintillation detector connected to a single-channel analyzer NZG-601 /Czechoslovakia/. The pH of aqueous phase was measured by means of a pH-meter OP-211/l /Hungary/. Concentrations of manganese and iron in the basalts were measured on a Perkin-Elmer Model 380 atomic absorption spectrometer in acetylene-air flame.

**Decomposition of geological samples**

The basalts were taken from two localities - Smrčí/I/ the district Semily and Konradovce/II/ the district Lučenec. Having ground the samples, 200 mg of each were decomposed according to Imamura$^{14}$. The residue was dissolved in 10 cm$^3$ of 6N HCl and filtered. The filtrate was diluted with distilled water to 50 cm$^3$ and Mn and Fe were measured by atomic absorption spectrometry.