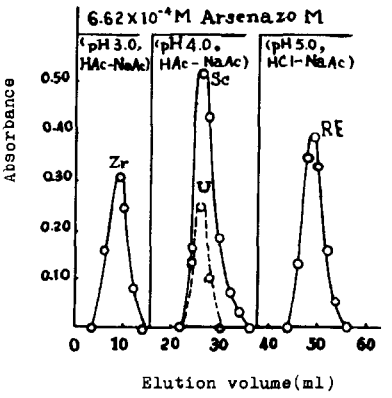

Fig. 3. Elution curve of Zr–Sc (or U–RE).

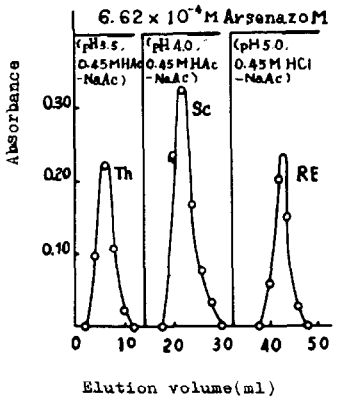

Fig. 4. Elution curve of Th–Sc–RE.

According to the experimental results the complete separation of the ternary mixtures may be achieved by a column (0.8 cm × 10 cm). The flow rate was 0.5–1.0 ml/min. The elution was carried out at room temperature.

Procedure of column separation: Solution of mixture of Zr/Sc(U)/RE (or Th/Sc/RE) added to the column. Elution was carried out with Arsenazo M in the different media and pH. Elution curves for these mixture are given in Fig. 3 and 4. The metals were directly determined by spectrophotometry. The spectrophotometric determination of each element is presented in the literature [5].

The results of percentage recovery are shown in Table I.

The method was applied to the analysis of Th (0.017–0.17%), Sc (0.005–0.13%), and RE (0.6–2.9%) in ore samples with satisfactory results

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E31

Thermochromatographic Studies of the Heaviest Actinides

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The latest Dubna studies on the thermochromatographic behaviour of lanthanide and actinide elements in metallic columns are reviewed. At a very low concentration of oxygen in the carrier gas (He, Ar) and in the column material, under certain conditions, lanthanides and actinides form adsorption zones at about 600 °C in Ti columns. The deposition temperature increases beyond 1200 °C with increasing oxygen content. No separation of the elements has practically been observed. The chemical transport of gaseous lower oxides seems to be responsible for the behaviour of the elements under study in the presence of just minute quantities of oxygen.

When oxygen is practically removed by the addition of some calcium vapours to the carrier gas, those lanthanides and actinides known to be divalent metals are deposited in Ti columns at 500–600 °C, at the same time as the trivalent metals—at considerably higher temperatures. This can be understood if the elements are present in the atomic state and their valency in the adsorbed state is the same as that of the metals [1]. These regularities offer some prospects for the experimental study of the metallic valency of element 102. The basic scheme of such an experiment with the short-lived $^{252}102$ ($T_{1/2}$ = 3s, 30% SF) on a beam from a heavy ion accelerator is discussed. The necessary experimental conditions are chosen from experiments with some Yb tracers.

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Determination of Trace Rare Earth Impurities in High-purity Yttrium Oxide by Using Ion-exchange Separation and Spectroscopic Method

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Since the sensitivity of direct emission spectroscopic method is not enough to analize rare earth impurities in high-purity rare earth oxides, a separation and pre-concentration step is always required. In the present paper, a cation exchange spectroscopic method is described. α-Hydroxyisobutyric acid is used as an efficient eluant to separate La, Ce, Pr, Nd,