Studies of the Synthetic Inorganic Ion Exchanger. III: The Separation of the Fission Product by Means of a Stannic Phosphate Cation Exchanger

INOUE Yasushi

Journal or publication title: Science reports of the Research Institutes, Tohoku University. Ser. A, Physics, chemistry and metallurgy

Volume: 16

Page range: 290-290

Year: 1964

URL: http://hdl.handle.net/10097/27195
ABSTRACTS OF PAPERS
Published in Other Journals

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The Separation of the Fission Product by Means
of a Stannic Phosphate Cation Exchanger*

Yasushi Inoue

The Research Institute for Iron, Steel and Other Metals

Abstract

The mutual separation of various nuclides contained in fission product has been
carried out with a stannic phosphate cation exchanger. Various concentrations
of nitric acid and ammonium chloride solutions have been used as eluants, and the
separation has been performed on hydrogen- and ammonium-form exchangers.

The separations of $^{89}$Sr-$^{137}$Cs, $^{89}$Sr-$^{144}$Ce, $^{137}$Cs-$^{144}$Ce and $^{90}$Sr-$^{90}$Y were easy and
complete except for that of $^{137}$Cs-$^{144}$Ce on a hydrogen-form exchanger. $^{95}$Zr and
$^{95}$Nb were almost completely adsorbed on the exchanger over a wide range of
acidity and salt concentration; therefore, they were not eluted at all. As the
behavior of $^{106}$Ru is complex and its separation from other nuclides is impossible,
it is necessary to separate the ruthenium from the fission product in advance by a
method other than that of ion exchange.

With reference to the above results, the total analysis of the fission product on
an ammonium-form exchanger has been carried out. It is almost complete
except for the contamination of rare earth in the cesium fraction.

* The 1152nd report of the Research Institute for Iron, Steel and Other Metals. Published