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## Plutonium Salt-Free Stripping Agents - Advantages and Disadvantages

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Selective stripping of plutonium from the organic phase is the common way for separation of plutonium from uranium in the first cycle of PUREX-process. The goal of process is conversion of plutonium (IV) to not extractable by TBP plutonium (III). Iron (II) or uranium (IV), with hydrazine as stabilizer, are typically used as reductive agents. In this case stabilizer is responsible for stability of reducing forms of metals, preventing oxidation of one's by nitrous acid. Drawback of hydrazine as reducing agent is the possibility of obtaining of ammonium nitrate and hydrazoic acid as destruction products. In spite of many studied alternatives, most of industrial flowsheets of spent nuclear fuel processing are based on hydrazine nitrate use in plutonium stripping process. Use of salt-free reactants for reducing of secondary radioactive wastes volume is the main trend in the development of new flowsheets for SNF processing.

Reducing stripping as well as complexing stripping agents may be used for plutonium affinage.

Key requirements are salt-free compounds and possibility of plutonium concentration in process.

Many classes of organic compounds –such as hydrazine derivatives, for example, ethanolhydrazine etc., hydroxamic acids, carbohydrazide, diglycolic acid monoamides etc., were proposed and studied as potential salt-free chelating and reducing agents for plutonium stripping.

The goal of proposed work is the review of varied methods of plutonium stripping from the technological point of view. Advantages and drawbacks of studied chelating and reducing agents are discussed as well.

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