

“About Possible Use of Low-  
Temperature Melts for Plutonium Alloy  
Conversion to Pellet MOX-fuel.”

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The application of plutonium alloys as primary products for plutonium dioxide production gives an opportunity to reduce the working temperature and leads to using of low-temperature melts. The reduced working temperature significantly extends the list of possible construction materials and eliminates the problem related to pyrographite corrosion. There are no data on thermodynamics of plutonium oxo-compound formation in the low-temperature eutectic LiCl-KCl-CsCl and 3LiCl-2KCl melts at the temperature range lower than 600°C. The approximation (under using the data of high temperature range) is incorrect because of probable significant increase of stability for the highest oxidation state plutonium compounds.

In this research work the feasibility of plutonium dioxide powder precipitation has been studied, the peculiarities of this process have been revealed, and chemical and physical-chemical properties of the obtained powders and produced MOX-pellets have been analyzed as well.

The plutonium dioxide powders obtained in the low-temperature melts satisfy all up-to-date requirements on chemical composition and physical-mechanical properties, and it are suitable for production of pellets without additional treatment of the powder.