ОПТИМИЗАЦИЯ КАСКАДА С ДВУМЯ ДОПОЛНИТЕЛЬНЫМИ ОТБОРАМИ ДЛЯ ОДНОВРЕМЕННОГО КОНЦЕНТРИРОВАНИЯ ПРОМЕЖУТОЧНЫХ ИЗОТОПОВ МОЛИБДЕНА

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OPTIMIZATION OF THE CASCADE WITH TWO ADDITIONAL PRODUCT FLOWS FOR THE SIMULTANEOUS CONCENTRATION OF INTERMEDIATE MOLYBDENUM ISOTOPES

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A technique has been developed for optimizing a multiflow cascades to obtain highly concentrated intermediate molybdenum isotopes. It has been shown that the bee swarm method can optimize the cascade better than other numerical methods.

The problem of highly concentrated molybdenum isotopes production in multiflow cascades is considered. A method of the cascade with two additional product flows optimization has been developed. Two components intermediate in weight are concentrated simultaneously in those flows [1]. The optimization problem is solved using a variation of the partial flow cuts of the cascade stages. The optimization criterion is the minimum of the stage total feed flow while ensuring a given concentration of isotopes. A computational experiment was carried out to separate a mixture of molybdenum hexafluoride. Various cases for the separation of molybdenum isotopes in cascades with large step separation coefficients corresponding to gas centrifuges were considered. The experiment demonstrated the features of intermediate components concentrating in additional product flows of the cascade. The optimization was carried out by various numerical methods. It is shown that using of the bee swarm optimization has an advantage over the Hook-Jeeves method.

1. V. A. Palkin, Atomic Energy, 127(5), 269-274 (2019).