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从混合裂变产物中放化分离¹³²I

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摘要 依据混合裂变产物中碘及其母体碲的同位素的半衰期设计分离¹³²I的流程。该流程的主要步骤为浓HBr蒸发和CCl₄萃取。实验研究了浓HBr蒸发对碘的去污效果; 在硝酸介质中, 用含I₂的CCl₄作为萃取剂, 研究了HNO₃浓度、水相中KI含量和有机相CCl₄中I₂含量对¹³²I萃取率的影响, 测定了含SO₂水溶液对¹³²I的反萃率。用设计的推荐流程获得了放化纯的¹³²I, 其中含有的¹³¹I的活度为¹³²I的1.3%, 分离流程全程对¹³²I的化学回收率约为60%, 流程对主要γ核素的去污因子大于10³。

关键词 ¹³²I; 放化分离程序; HBr蒸发; CCl₄萃取

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Radiochemical Separation of ¹³²I From Mixed Fission Products

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Abstract The radiochemical separation procedure of ¹³²I was designed on the basis of half-lives of iodine and tellurium isotopes in mixed fission products. It mainly includes the evaporation step with concentrated HBr and the extraction step with CCl₄. Decontamination of iodine was studied by the process of evaporation with concentrated HBr. The effects of HNO₃ concentration, KI quantity in aqueous phase and I₂ quantity in CCl₄ on extraction recovery of ¹³²I were also researched. ¹³²I was back extracted by SO₂ aqueous solution in separation procedure. Using designed procedure, ¹³²I was separated from mixed fission products. The activity of ¹³¹I in separated ¹³²I is 1.3% of ¹³²I. The chemical recovery of ¹³²I is about 60% and the decontamination factor is more than 10³ for most γ-emitters.

Key words ¹³²I; radiochemical separation procedure; HBr evaporation; CCl₄ extraction

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