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萃取色层分离/ICP-AES法测定钆铀氧化物中的杂质

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摘要 研究了钆铀氧化物中29种杂质元素的测定。采用CL TBP从硝酸溶液中萃取色层分离基体铀,所得含杂质及钆的淋出液以电感耦合等离子体原子发射光谱仪采用多组分图谱拟合法(MSF)测定。研究了MSF模型的建立与考查、不同杂质浓度下的回收率等。结果表明,方法对钆铀样品中29种杂质元素,即Al、Ba、Ca、Co、Cr、Cu、Fe、Li、Mg、Mn、Mo、Na、Ni、Ti、Zn、Ta、W、Th、Bi、Pb、Sn、V、In、Ag、B、Cd、Sm、Eu、Dy的测定准确可靠。对于其它杂质含量相当的铀/钆化合物,通过适当的处理和转化,也可采用本方法测定。

关键词 杂质 铀 钆 萃取色层 ICPAES 多组分图谱拟合

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Determination of Impurities in (Gd,U)O_2 by Column Extraction Chromatography and ICP-AES Multi-component Spectral Fitting

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Abstract Studies on the determination of trace impurities in ((Gd,U)O_2) were described. The bulk of the matrix U was separated by column extraction chromatography from its nitric acid solution using CL-TBP. The collected aqueous fraction containing the impurities and gadolinium was fed to an ICP-AES for determination using a new interference correction technique— ~~m~~ulti-component spectral fitting(MSF). The studies also includes the setting up and validity testing of the MSF model, the recovery of impurities at various concentrations, etc. Based on the above studies, the methods were standardized for the determination of 29 elements, viz. Al,Ba,Ca,Co,Cr,Cu,Fe,Li,Mg,Mn,Mo,Na,Ni,Ti,Zn,Ta,W,Th,Bi,Pb,Sn,V,In,Ag,B,Cd,Sm,Eu and Dy in (Gd,U)O_2 samples. Similar levels of these elements in other uranium and/or gadolinium compounds can also be determined if they are treated and converted to the same aqueous fraction.

Key words impurity uranium gadolinium column extraction chromatography ICP-AES multi-component spectral fitting

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