

研究简报

⁷⁹Se-AMS生物示踪方法学的研究

王伟¹;何明¹;陈春英²;李柏²;陆丽燕¹;龚杰¹;吴绍雷¹;周国强²;焦芳²;许耀刚²;赵金璇²;武绍勇¹;姜山¹

1. 中国原子能科学研究院,核物理研究所,北京 102413

2. 中国科学院,高能物理研究所,北京 100049

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摘要 由于具有放射性非常弱以及对生物组织甚至是细胞无损伤的特点,⁷⁹Se是对硒元素进行长期无损伤生命科学研究的理想示踪核素。⁷⁹Se示踪方法学的建立对于硒的生命科学与生物医学研究将具有十分特殊的意义。加速器质谱测量⁷⁹Se(⁷⁹Se-AMS)的生物示踪方法学具有高灵敏度,高准确性以及高精度等特点。通过采用⁷⁹Se-AMS方法对亚毒性剂量的硒代谢过程进行研究,建立了⁷⁹Se-AMS生物示踪方法学,重点探索了生物示踪样品的制备流程,化学处理以及样品测量过程。采用分子负离子的引出形式以及四阳极双栅电离室对⁷⁹Se和⁷⁹Br两种同量异位素进行鉴别,从而记录实际样品中⁷⁹Se的原子个数。实验建立了亚毒性剂量硒在Wistar大鼠肾脏内的代谢曲线,为生命科学以及生物医学领域提供了新的测量方法与手段,也为AMS的应用开拓了新的领域。

关键词 [⁷⁹Se](#) [加速器质谱仪](#) [生物示踪](#)

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Biological Tracer Methodology of ⁷⁹Se-AMS

WANG Wei¹; HE Ming¹; CHEN Chun-yi ng²; LI Bai²; LU Li -yan¹; GONG Ji e¹; WU Shao -l e¹; ZHOU Guo -qi ang²; JIAO Fang²; XU Yao -gang²; ZHAO Ji n-xuan²; WU Shao -yong¹; J IANG Shan¹

1. Department of Nuclear Physics, China Institute of Atomic Energy, Beijing 102413, China; 2. Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

Abstract ⁷⁹Se, with little radioactivity and little intrusiveness to biological tissue even to cell, is an ideal tracer nuclide for long period and non-intrusive biological research of selenium. Establishment of its tracer methodology is significant in biomedicine and life science. ⁷⁹Se-AMS is an alternative owing to its high sensitivity, accuracy and precision. Tracer experiment using ⁷⁹Se was carried out to investigate the metabolism kinetics of selenium in the rat kidney, and therefore establishment of ⁷⁹Se-AMS biological tracer methodology is detailed, including tracing sample preparation, chemical procedure, and AMS measurement processing. During AMS measurement, molecular negative ions of SeO⁻² were extracted from the ion source, and the counts of ⁷⁹Se were determined from the discrimination between ⁷⁹Se and ⁷⁹Br by four-anode double-grid ionization chamber. Metabolism curve of sub-poisonous selenium in the kidney of Wistar rat was established finally. Further applications of ⁷⁹Se-AMS for biological research will be explored.

Key words [⁷⁹Se](#) [accelerater](#) [mass](#) [spectrometry](#) [biological](#) [tracer](#)

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