原子能科学技术 2008 42 (z1): 322-325 ISSN: 1000-6931 CN: 11-2044/TL

技术及应用

CR-39探测器对α粒子入射角度和能量响应的实验研究

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收稿日期 2008-6-30 修回日期 2008-7-22 网络版发布日期: 2008-9-20

摘要 为掌握固体径迹探测器CR-39对α粒子的入射角度和能量响应特性，通过建立1个可调节α粒子的入射角度和入射能量的241Am源照射系统，进行了不同入射角度和入射能量的α粒子照射CR-39探测器的实验研究，比较了不同照射条件下的径迹密度。实验结果表明，CR-39对α粒子的能量响应下限约为0.5 MeV，对入射角度响应的上限约为70°。本研究结果可为优化设计测氡的扩散杯（瓶）、提高其对氡的探测效率等提供科学的指导依据。

关键词 CR-39探测器；α粒子；角度响应；能量响应；氡

分类号 TL818.7

Experimental Study on CR-39 Response to Alpha Particles With Different Incident Angles and Energy

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Abstract In order to grasp the angle and energy responses of allyl diglycol carbonate (CR-39) detector to incident alpha particles, a 241Am irradiation system which was allowed to adjust the incident angles and energies of alpha particles was set up. Through the experiment and comparison of the track densities in different irradiation conditions, it was found that the CR-39 detector is sensitive to those alpha particles with incident energies larger than 0.5 MeV and incident angles less than about 70°. The results are helpful for the optimizing design of diffusion chamber for airborne radon measurements with CR-39 detectors.

Key words CR-39 detector α particle angle response energy response radon

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