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热中子参考辐射场

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摘要 在中国原子能科学研究院重水反应堆热柱上建立了热中子参考辐射场。中子能谱用飞行时间法测量;中子注量率用金活化箔和２３５Ｕ 电离室两种探测器进行绝对测量，其结果分别为１．１４×１０６（１±１．２％） ｃｍ － ２·ｓ － １和１．１５×１０６（１±２．２％） ｃｍ － ２·ｓ － １。对束的空间分布、镉比和γ本底剂量也进行了测量。其中，镉比为１．１×１０４ （１±１０％），γ本底剂量在４０ ｃｍ 和１００ ｃｍ 处分别为５ ｍ Ｇｙ·ｈ － １和０．９ ｍ Ｇｙ·ｈ － １。

关键词 中子能谱 中子注量率 空间分布 镉比 γ剂量

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THE NEUTRON REFERENCE RADIATION FIELD AT THE THERMAL ENERGY REGION

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Abstract The thermal neutron reference radiation field at thermal column of the heavy water reactor of China Institute of Atomic Energy (CIAE) has been established. Its energy spectrum has been measured by use of a chopper. The absolute fluence rate has been acquired by using both gold activation technique and a 235 U ionization chamber.The results are respectively 1.14 ×10 6(1± 1.2 %) cm -2 ·s -1 and 1.15×10 6(1±2.2 %) cm -2 ·s -1 . The neutron fluence distribution along x,y,z directions, its cadmium ratio and the gamma ray dose of the beam have also been measured as well. Therein, the cadmium ratio is 1.1×10 4(1±10 %) and the gamma ray doses are 5 mGy·h -1 (40 cm to the hole of reactor) and 0.9 mGy·h -1 (100 cm), respectively.

Key words Neutron energy spectrum Neutron fluence rate Fluence distribution Cadmium ratio Gamma ray dose

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