

φ76mm×100mm BGO闪烁探测器在20 MeV以下能区的能量响应

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摘要 用上海硅酸盐所提供的φ76mm×100mm BGO晶体制作γ闪烁探测器、用来探测重离子核反应中放出的10-100 MeV的γ射线,该探测器对¹³⁷Cs的0.661 MeV γ射线的能量响应为14.2%。在加速器上用若干(p,γ)反应产生的单能光子测试探测器的能量响应,通过细致的数论拟合得到该探测器在20 MeV以下能区的能量响应和全能峰能量分辨率。对17.65 MeVγ射线。探测器的能量分辨率为4.1%。

关键词 [BGO闪烁探测器](#) [能量响应](#) [次级电子](#) [韧致辐射](#) [非线性拟合](#)

分类号

ENERGY RESPONSE OF A φ 76mm×100mm BGO SCINTILLATION DETECTOR FOR GAMMA-RAYS BELOW 20 MeV

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Abstract A 76 mm-diameter by 100 mm-long BGO scintillation detector is assembled to detect the highenergy gamma-rays produced from intermediate energetic heavy-ion nuclear reaction. The energyresponse of the detector is studied in the incident gamma-rays energy range of 0.661 MeV to17.65 MeV, the monoenergetic gamma-rays are generated by radiative sources and several lowenergy (p, γ) resonant nuclear reactions. The response function is obtained by delicate datafitting. The full energy peak energy resolution is 14.2% at 0.661 MeV and 4.1% at 17.65MeV, respectively. One analyzing method of the energy spectra of high energy gamma-rays is also discussed in the paper.

Key words [BGO scintillation detector](#) [Energy response](#) [Secondary electron](#) [Bremsstrahlung](#) [Non-linear fit](#)

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