技术及应用

# SND-S1型液体闪烁体光输出的能量响应

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摘要　　采用不同能量的γ射线标准源及D-D、D-T核反应的单能中子源分别测定了新型液体闪烁体SND-S1的光输出随粒子能量的变化,采用Monte-Carlo程序Penelope模拟计算了 $^{137}$Cs γ射线的能量分布谱，最大康普顿电子能量的计算值和实验值相差2.7%。将实验结果与文献值作了比较，能量低于3 MeV时，符合较好；能量高于6 MeV时，略有差别。结果表明，液体闪烁体的光输出与电子能量呈线性正比关系，而与中子能量呈非线性关系。

关键词　 液体闪烁体；光输出；能量响应

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# Measurement of Light Output Function for SND-S1 Liquid Scintillator

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Abstract　The light output as a function of electron and proton energy for SND-S1 liquid scintillator was measured using several γ-ray sources and mono-energy neutrons from D-D, D-T nuclear reactions. The electron energy spectra of $^{137}$Cs (resolution-free) was calculated by Monte-Carlo code Penelope. It is found that the difference of the maximum Compton electron energy between n calculated and measured values is 2.7%.The experiment results were compared with those of literatures. For energy below 3 MeV, results are in excellent agreement with all literatures'; Above 6 MeV, in excellent agreement with one literature's and in moderate agreement with others'. The results indicate that the increase of the light output of liquid scintillator linearly depends on the energy of electron, but nonlinearly on the energy of proton.

Key words　liquid scintillator; light output; particle energy response

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