

HYDROGEN FREE LIQUID SCINTILLATOR EJ-313

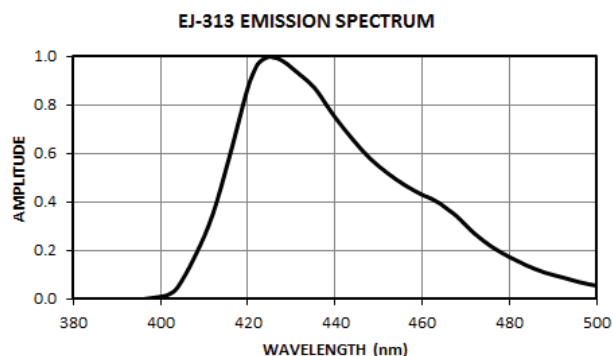
EJ-313 is based on highly purified hexafluorobenzene and, as it is almost free from hydrogen, it is relatively insensitive to fast neutrons. Thus, it is useful for gamma ray detection in a fast neutron flux.¹ According to Jupiter and Parez², the ratio of the relative gamma ray response to neutron responses for EJ-313 compared to a xylene-based liquid scintillator is 14.5 for 2.6 MeV neutrons and 8.5 for 1 MeV neutrons. Ewen and Gonsior³ found that the gamma ray and neutron efficiencies of this hydrogen-free scintillator to be 25% and 0.4% respectively, relative to those of a NaI(Tl) detector.

References

1. S. Homma & S. Takemoto, Rev. Sci. Instr. 32, No. 9, 1055 (Sept. 1961)
2. C.P. Jupiter & J. Parez, IEEE Trans. Nucl. Sci., NS-13, (1) 692-703 (1966)
3. K. Ewen & B. Gonsior, Nucl. Instr. & Meth., 99, 573-578 (1972)



| PROPERTIES | EJ-313 |
|----------------------------------------------------|--------|
| Light Output (% Anthracene) | 20 |
| Scintillation Efficiency (photons/1 MeV e-) | 3,060 |
| Wavelength of Maximum Emission (nm) | 425 |
| Decay Time, Short Component (ns) | ~ 3 |
| Bulk Light Attenuation Length (m) | > 1 |
| Specific Gravity | 1.619 |
| Refractive Index | 1.38 |
| Flash Point (°C) | 10 |
| Boiling Point (°C at 1 atm) | 80 |
| F Atoms per cm ³ (×10 ²²) | 3.14 |
| H Atoms per cm ³ (×10 ²⁰) | 1.02 |
| C Atoms per cm ³ (×10 ²²) | 3.15 |
| Electrons per cm ³ (×10 ²³) | 4.72 |



Revision Date: 2/11/2016



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