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#11-85 The effect of the aging of liquid organic scintillators used for gamma-neutron separation

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Since the beginning of using liquid scintillators for gamma-neutron separation, there have been many articles dealing with long-term degradation especially due to oxygen presented during scintillator encapsulation. The effect of aging of liquid organic scintillators namely EJ 301, EJ309 (both Eljen Technology), and new house-made cocktails based on 1-Phenyl-3-(2,4,6-trimethylphenyl)-2-pyrazoline and 2,5-Bis(5-tert-butyl-benzoxazol-2-yl)thiophene fluors were investigated for more than half a year. The research was focused on the Compton edge shifting of gamma particles since the position is proportional to the light yield of the selected scintillator. Furthermore, the gamma-neutron separation was observed and quantified using FOM (Figure Of Merit) for samples prepared and filled under normal and nitrogen atmosphere during the mentioned period. All stated parameters of liquid scintillator NE 213 manufactured by Nuclear Enterprises Limited opened more than three decades ago were measured and used for comparison.

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