

Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Metal-loaded Liquid Scintillator for Neutrino Experiments¹

SUNEJ HANS, LIANGMING HU, WAI TING CHAN, WANDA BERIGUETE, RICHARD ROSERO, JAMES CUMMING, MINFANG YEH, Brookhaven National Lab — Success of neutrino experiment requires a combined knowledge of chemistry and physics for its detector design and operation. Organic liquid scintillator (LS) has been selected as one of the main detection mediums for neutrino interactions since the early demonstrated experiment of Reines and Cowan. Metal-loaded LS (M-LS) can be used for different applications in neutrino researches, where diverse choices of metals serve different functions. Fundamental aspects of the M-LS for neutrino detection are extended chemical stability, long attenuation length, high photon production, and ultra-low radioactive impurity. BNL Neutrino & Nuclear Chemistry group has been focusing on the development of new metallic-ion loading techniques for numerous neutrino experiments since early 2000. The challenges and applications of M-LS for neutrino experiments will be reported.

¹Research sponsored by the U.S. Department of Energy, Office of Nuclear Physics and Office of High Energy Physics, under contract with Brookhaven National Laboratory-Brookhaven Science Association.

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Date submitted: 05 Jan 2012

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