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Development of various liquid scintillators for the next generation neutrino experiments

Liquid scintillator (LS), which is a mixture of a base solvent plus a scintillating solute, has been used to detect neutrinos coming from atmospheric, solar, accelerator beam and reactor experiments. Then metals such as Cd, Gd, Li, B, Yb, Tn, etc, are loaded into LS. In all neutrino experiments, researchers have tried to develop their LS and metal-loaded LS to achieve a long attenuation length, high light output as well as chemical and optical stability over several years. It is also important to have chemical compatibility between the metal-loaded LS with acrylic and other LS construction materials. Safety concerns for the environment and human body must also be satisfied. We have developed several oil-based and water-based liquid scintillators using various surfactants, then loaded with metals. In this poster, we will summarize all the characteristics of the various liquid scintillators for the future neutrino experiments.

Primary author: Mr KIM, Seungchan (Department of Physics, Chonnam National University, Korea)

Co-authors: Mr YEO, Insung (Department of Physics, Chonnam National University, Korea); Prof. JOO, Kyung Kwang (Department of Physics, Chonnam National University, Korea); Ms SONG, Sookhyung (Department of Physics, Chonnam National University, Korea); Ms SO, Sunheung (Department of Physics, Chonnam National University, Korea)

Presenters: Mr KIM, Seungchan (Department of Physics, Chonnam National University, Korea); Ms SONG, Sookhyung (Department of Physics, Chonnam National University, Korea)

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