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Study on HQ-LAB for the JUNO Experiment

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A 20 kton large volume liquid scintillator detector is being constructed at Jiangmen, China, to determine the neutrino mass hierarchy, and measure the neutrino oscillation parameters. The excellent energy resolution and the large fiducial volume anticipated for the JUNO detector offer exciting opportunities for addressing many important topics in neutrino and astroparticle physics. High quality Linear Alkylbenzene (HQ-LAB) will be used as a solvent for the liquid scintillation system, and its light attenuation lengths should be comparable to the diameter of the JUNO central detector,
In this poster, we briefly introduce the LAB samples prepared by the various methods, especially by the improved techniques that are more suitable for large-scale mass productions. We measured their light attenuation lengths and then analyzed their chemical composition by a Q Exactive GC-MS technique, and some of the structure formulas of organic impurities were determined. By studying the overall optical transparency of LAB samples, it will further help us to promote the LAB preparation processes suitable for the mass production, to meet the stringent requirements of producing 20 kton HQ-LAB in the near future.

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