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**Barium Tagging for nEXO in Liquid and Gas Xenon** SCOTT KRAVITZ, THOMAS BRUNNER, DAN FUDENBERG, Stanford University, NEXO COLLABORATION — nEXO is a next-generation multi-ton experiment currently under development to search for neutrinoless double-beta decay of Xe-136. A positive observation will determine the neutrino to be a Majorana particle. In order to greatly reduce backgrounds for this search, the nEXO collaboration is developing several techniques to recover and identify the decay daughter, Ba-136 (“barium tagging”). This technique may be available for a second phase of the nEXO detector and will improve the sensitivity to probe the neutrino mass scale beyond the inverted hierarchy. A setup to demonstrate Ba ion capture on a probe and subsequent identification through resonance ionization spectroscopy has been developed, and is being used to investigate possible probe substrates, including graphene. For a gas phase detector, appropriate for a later stage, a separate apparatus to extract Ba ions using an RF-only funnel has been constructed and demonstrates extraction of ions from high-pressure Xe to vacuum consistent with simulations. We will describe the status of these systems and the present results of this R&D program.

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