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Analysis of Outgassing Properties of Candidate Materials for Use With the nEXO Experiment TWYMUN SAFFORD, Univ of West Florida, LIANG YANG, University of Illinois at Urbana-Champaign, EXO TEAM — The experimental search for neutrinoless double beta decay ($0\nu\beta\beta$) is a test of the Majorana nature of neutrinos and the violation of lepton number. With some uncertainty, the rate of neutrinoless double beta decay is also proportional to the square of the effective Majorana neutrino mass. EXO-200 is an experiment designed to search for double beta decay of xenon-136 using a single-phase, liquid xenon detector. EXO-200 uses an active mass of 110 kilograms of liquid xenon-136 enriched to 80.6% in an ultra-low background time projection chamber capable of simultaneous detection of ionization and scintillation. The University of Illinois at Urbana-Champaign collaborates with the EXO-200 experiment. During the summer at the University of Illinois at Urbana-Champaign, research was conducted by utilizing a vacuum chamber in tandem with a vacuum pump to analyze the outgassing properties of various candidate materials in terms of electronegative impurities for use with the future nEXO experiment. Materials such as kapton flexible connection cables were used. In the future, plans to construct a carbon nanotube-based adhesive will be executed to inexpensively simulate the behavior of parts used in the recirculation process of the liquid xenon.

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