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Exploration of Methods to Remove Implanted Pb-210 and Po-210 Contamination from Silicon Surfaces

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The relatively long-lived Pb-210 (half-life of 22 years) and its progeny can be problematic sources of background for rare-event physics experiments. Pb-210 can be present in the bulk of materials at detrimental levels and concentrated at the surfaces of detector components as a result of exposure to environmental radon, where its decay products (and those of its progeny such as Po-210) can cause background issues on or near active detector targets. This talk will present on a variety of mitigation techniques to remove implanted ^{210}Pb and ^{210}Po from silicon surfaces. Both chemical and physical methods were explored which ranged in efficacy, with some of the most promising approaches allowing for the near complete removal of Pb-210 and Po-210. Approaches may be implementable during different phases of detector construction of silicon devices in order to remove Pb-210 and Po-210, and/or provide avenues for mitigation techniques for removal of Pb-210 and Po-210 from other detector materials.

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