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The challenges of radon-generated Po-210 surface contamination removal[1] VINCENTE GUISEPPE, FRANKLIN ADAMS, Univ of South Carolina, CABOT-ANN CHRISTOFFERSON, South Dakota School of Mines and Technology — The next generation low-background detectors operating deep underground aim for unprecedented low levels of radioactive backgrounds. The deposition and presence of radon progeny on detector surfaces and surrounding materials is an added source of energetic background events. In addition to limiting the detector material's radon exposure to reduce potential surface backgrounds, it is just as important to clean surfaces to remove inevitable contamination. Previous studies of radon progeny removal from metal surfaces have generally found that a form of chemical etching is effective at removing some of the progeny (Bi and Pb), however more aggressive techniques are often necessary to effectively remove the Po atoms. In the absence of a more aggressive technique, a significant fraction of the Po atoms are believed to either remain behind on the surface or redeposit from the etching solution back onto the surface. We explore the nature of aqueous Po ions, the oxidation state of Po necessary to keep Po in solution, and the role of chemical kinetics during the etching of contaminated Cu surfaces. We present our findings on the role of oxidation and kinetics in the preparation of a clean etching technique.

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Vincente Guiseppe
Univ of South Carolina

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