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# Study on the feasibility of incorporating ozonized water into the ultra-high vacuum chemical cleaning process for aluminum vacuum chambers

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The feasibility of incorporating ozonized water into the ultra-high vacuum (UHV) chemical cleaning process for aluminum vacuum chambers was investigated. The experiments were conducted using custom-designed wet bench equipment under various temperature and time conditions. Auger analysis was used to evaluate the removal of organic contaminants, and TEM analysis measured changes in oxide layer thickness. Subsequently, similar experiments were conducted on a prototype 4GSR vacuum chamber, and vacuum quality was assessed through outgassing rate measurements and RGA analysis. Based on these results, we quantitatively and qualitatively determined the optimal reaction time, temperature, and process sequence for ozonized water treatment in UHV chemical cleaning. This method is expected to more effectively remove initial chemical impurities and physical contaminants from the surface or interior of aluminum materials under specific conditions. Consequently, it may help reduce photon-stimulated desorption rates, contributing to a shorter conditioning time in the 4GSR project and ultimately enabling the achievement of higher vacuum levels.

## Footnotes

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