

Abstract Submitted
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Atmospheric Ball Plasma Interactions¹ C.J. V. WURDEN, Los Alamos High School, G.A. WURDEN, Los Alamos National Laboratory — Free-floating atmospheric pressure copper hydroxyl ball plasmas have been studied in air and helium atmospheres, using still and high speed photography (up to 20,000 fps), collimated photodiodes, and spectroscopy. A fine boundary layer between the greenish Cu-OH cloud, and the air, is orange in color. However, when the discharge is initiated into a helium atmosphere, the boundary layer is no longer visible, suggesting that the visible boundary was caused by interactions with oxygen. We have studied scaling of the 10-cm diameter ball plasmas with both the size of the water bucket, and the applied discharge voltage, over the range of 500-5000 volts. When looking at the initial spider-leg breakdown above the water surface, the ratio of H-alpha to H-beta lines suggests a temperature of ~ 0.3 eV. This is also consistent with the presence of molecular lines of OH, and perhaps CuOH₂ in the rising cloud. The cloud is affected by, but can penetrate through an aluminum window screen mesh.

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