

Stephanie Wong

*Making Sparks from Water with a Kelvin Water Dropper*

The purpose of this project was to see how the water conductivity affected the voltage build-up in a Kelvin Water Dropper. The Kelvin Water Dropper uses accumulated charge to induce charge in water drops, which then add to the accumulated charge. It was expected that with pure water, no voltage would build up because pure water is an insulator. With salt water, the voltage was expected to build up quickly because salt water is a good conductor. In the experiment, the Kelvin Water Dropper charging times were recorded every 0.5 kilovolts, and were then compared with the times of other trials which used different types of water. The first runs lacked reproducibility: when nothing was altered, the times differed greatly. To address this, the procedure was altered to induce the charge in the water drops with a high voltage power supply, rather than using accumulated charge. This yielded reproducible data, and made it possible to also test the effects of different voltages and different drip rates. The data indicated that there was no real difference between the data with distilled water and that with salt water. However, when vegetable oil, an excellent insulator, was used, no charge built up at all. This result shows that conductivity is required for a Kelvin Water Dropper to function.