

## **Efficient Liberation of Stored Hydrogen Bond Energy from Liquid Water – A Novel Renewable Energy Resource**

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Pulsed high current arcs in liquid water are regularly observed to produce powerful explosions which have several commercial applications from medicine to civil engineering. Experiments that have measured the momentum of the resulting micron-scale droplets have indicated that their net directed kinetic energy can be greater than the supplied electrical energy. Since no gaseous hydrogen or oxygen is generated, it can only be deduced that the source of the gained energy is the ruptured hydrogen bonds. This excess energy is not observed when water is vapourized by heat and thus the mechanism for efficient liberation of the stored energy is hypothesised to be the result of cold directed forces between individual water molecules, which in the case of the water arc explosions are presumably of electrodynamic origin. To test this theory, an experiment was devised in which the power balance of a continuous electrospray system was analysed which subjects water molecules to bond breaking electrostatic forces.

The apparatus pumps a fine stream of water down a vertically mounted steel capillary tube which is at high electric potential relative to a lower horizontal electrode. The liquid stream is torn into droplets by vertical electrostatic forces near the tip of the nozzle and forms an aerosol of micron-scale droplets whose size and velocity can be easily monitored. Under certain stable conditions, the total downward kinetic power of the droplet flow can be measured and has been found to be greater than all of the power inputs into the system which are dominated by the supplied electric power.

The energetics of generic chemical bonding are discussed to demonstrate that although this discovery has never been publicly anticipated, it is consistent with conventional theory. These experiments suggest possible exploitation of this stored energy for the generation of electricity. Since the chemical nature of the water is not changed during the conversion from bulk to droplets, then water need not be consumed like a fuel and there are no exhaust products. Instead, observations and present understanding indicate that the droplets are rapidly converted back to bulk form by the absorption of atmospheric heat. Therefore it is possible in principle to produce a renewable energy electricity generator with an enclosed volume of water which produces power by tapping into the thermal heat bath which surrounds us. Several suggestions of suitable energy harnessing devices are suggested ranging from pistons to micro-turbines.