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A solar process to end anthropogenic global warming; STEP (Solar Thermal Electrochemical Photo) generation of energetic molecules[1]

STUART LICHT, George Washington University — An alternate process to convert solar energy is derived which captures sunlight with conversion efficiency greater than that of photovoltaics. In this STEP process, rather than electrical generation, solar energy directly provides the chemical products needed by society. This original process is derived for the solar generation of energetically rich chemicals, including chlorine, metals, hydrogen and to proactively convert anthropogenic carbon dioxide generated in burning fossil fuels. The STEP process distinguishes radiation that is energy sufficient to drive photovoltaic charge transfer, and applies all excess energy to heat and decrease the energy of enodothermic electrolysis reactions. Energy sufficient, visible, sunlight drives photovoltaic charge transfer, and available heat, infrared sunlight, and excess visible sunlight, heats, and decreases the energy of, an electrolysis reaction. For example, from the STEP conversion theory, sunlight will recycle and remove carbon dioxide at 50% solar efficiency. Details at: "STEP generation of energetic molecules," J. Phys. Chem., C, 113, 16283 (2009).

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