

# NOVEL METHOD FOR WATER THERMOLYSIS AND CO<sub>2</sub> TRANSFORMATION TO HYDROCARBONS

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## Abstract

In this paper we present our breakthrough concerning the establishment of a new sustainable methodology for the water thermolysis at temperatures below 300°C and the immediate corresponding production of energy or fuels. The method is based on our experimental evidence of water thermolysis at 286°C in the presence of Fe<sub>3</sub>O<sub>4</sub>nanoporous catalytic thick films, with the sustainable maintenance of the catalyst due to a new reduction method based on Lorentz force electrons generated by a magnetic field in the vicinity of the electric current heating the semiconducting catalyst. The method is used for the production of hydrogen and oxygen, as well as of fuels in the presence of CO<sub>2</sub> in order to reduce CO<sub>2</sub> to CO or even to hydrocarbons, (like Synthetic Natural Gas – SNG) via methanation. The consequent development of the explanation and modelling of the obtained results, together with the establishment of the experimental procedure, open new windows in the fields of energy & environment, nanomaterials and processes, industrial environment (factories for the future), transportation, renewable fuel production and information technology.

**Keywords:** water thermolysis, catalysts, Lorentz force