

Hydrogen Generation from the Dissociation of Water Using Microwave Plasmas

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Hydrogen was produced by the direct dissociation of water vapor, i.e., splitting water molecules by the electrons in a water plasma, at low pressure (< 100 Torr) using a microwave plasma discharge. A microwave plasma source was developed utilizing the magnetron of a microwave oven and a TE₀₁ rectangular waveguide. The best energy efficiency we obtained was 90% using a microwave power of 400 W. If the water is vaporized by free energy sources such as solar energy or is the waste vapor at a steam generating power plant, then electrical energy, which is generated by hydrogen, can be bred through contemporary fuel cells in a system such as ours.