

# **Solar Thermochemical Water-Splitting for Hydrogen Production: The Hydrosol Process**

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We present the Hydrosol process for solar thermochemical hydrogen production via water splitting in monolithic reactors. The reactor concept is adapted from the well-known automotive emission control field, and consists of a multichannel ceramic honeycomb body, coated with nanostructured mixed oxide materials. The coating is able to cycle between a reduced and an oxidized state. The reactor is heated by concentrated solar radiation and is fed with water vapor. The active coating reacts with the water molecule by “trapping” its oxygen and leaving in the effluent gas stream pure hydrogen. In a subsequent step, the oxygen “trapping” material is regenerated, by increasing the amount of solar heat absorbed by the reactor; hence a cyclic reduction-oxidation (redox) operation is established. Monolithic reactors represent a very promising technology for large-scale, emissions-free solar thermochemical hydrogen production.