A UH engineer and Rice University chemist have discovered a single catalyst that can split water into hydrogen and oxygen, producing clean energy.

The electrolytic film—a three-layer structure of nickel, graphene and a compound of iron, manganese and phosphorous—was produced at Rice and tested at the UH Cullen College of Engineering by electrical and computer engineering Professor Jiming Bao. The catalyst is described in a paper published in Nano Energy.

Discovering an efficient and cost-effective method of water splitting could drastically alter the energy landscape, since hydrogen is a clean and efficient fuel. Past research has yielded catalysts that effectively produce either hydrogen or oxygen from water, but not both. Bao and Rice chemist Kenton Whitmire’s film overcomes these barriers.


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