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Platinum Increases Hydrogen Photoproduction

Platinum group metal complexes find extensive use as sensitisers, photocatalysts and photoelectrodes in harvesting sunlight to produce electricity or hydrogen by the electrolysis of water (1). Hydrogen is usually photoproduced from water using semiconductors and catalysts, and polymer semiconductors combined with ruthenium chloride can produce hydrogen effectively.

Now scientists from the Tokyo Institute of Technology (2) report a photocatalytic system which produces hydrogen from the electrolysis of water using a semiconducting chelating π -conjugated polymer poly(2,2'-bipyridine-5,5'-diyl), which has a strong affinity towards metals,

and [Pt(bpy)₂](NO₃)₂ (bpy = 2,2'-bipyridyl) as photocatalyst in aqueous NET₃ solution.

When irradiated with light, the system produced hydrogen with a turnover number of H₂: [Pt(bpy)₂]²⁺ of 490 and maintained this activity over several cycles. This is thought to be related to the ability of the polymer to trap platinum as [Pt(bpy)]²⁺ on its surface.

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