# Pt Nanoparticles@Photoactive Metal-Organic Frameworks: Efficient Hydrogen Evolution via Synergistic Photo-excitation and Electron Injection

Meyer

## Scientific Achievement

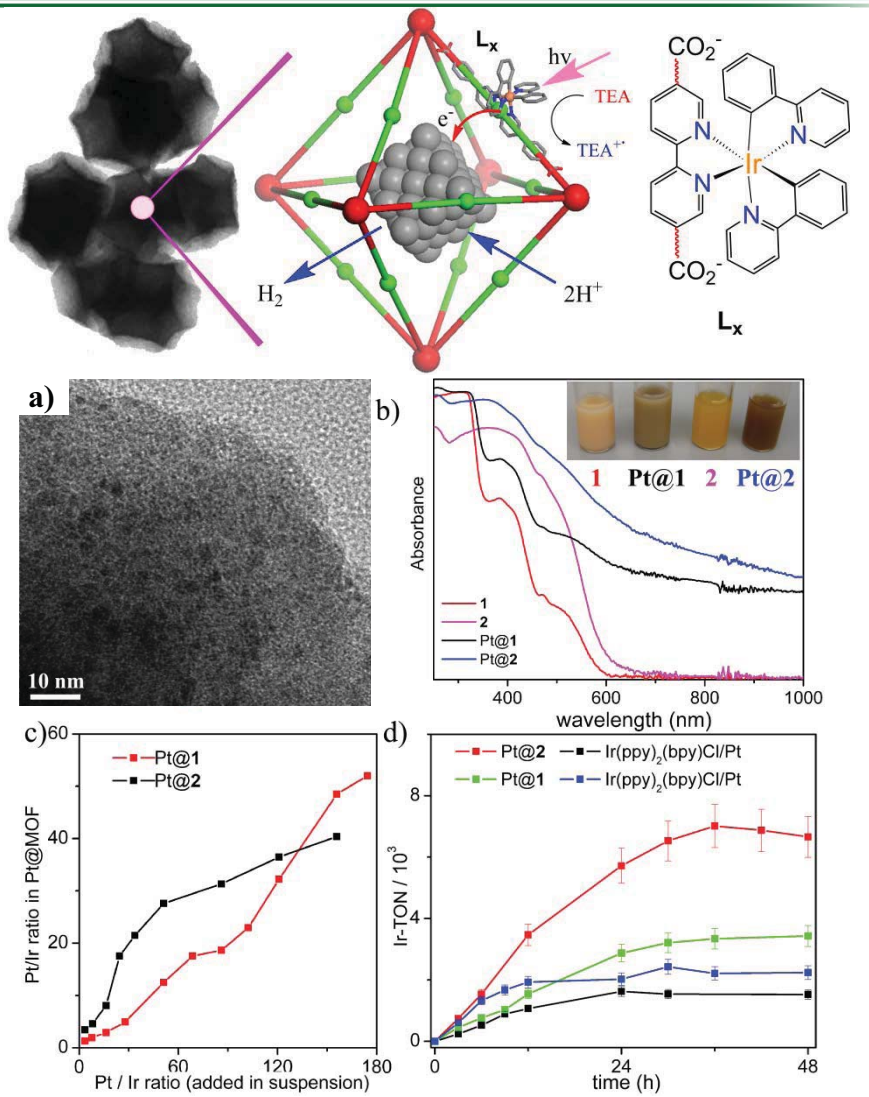
**We report here that Pt@MOF assemblies serve as effective photocatalysts for hydrogen evolution by synergistic photo-excitation of the MOF frameworks and electron injection into the Pt nanoparticles.**

## Significance and Impact

**Our observations provide a strategy for integrating different functionalities into a framework material to achieve water splitting and $CO_2$ reduction.**

## Research Details

- Pt nanoparticles were loaded into stable, porous, and phosphorescent MOFs built from $[Ir(ppy)_2(bpy)]^+$-derived bridging ligands via MOF-mediated photoreduction of $K_2PtCl_4$.
- Pt@MOF gave a TON of 7000, five times the value afforded by the homogeneous control, and could be readily recycled and reused.
- MOFs thus provide a versatile and tunable platform to hierarchically integrate different functional components for solar energy utilization.





Wang ,C.; deKrafft, K.E.; Lin W. *J. Am. Chem. Soc.* **2012**, *134*, 7211.



Work was performed at the University of North Carolina at Chapel Hill



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