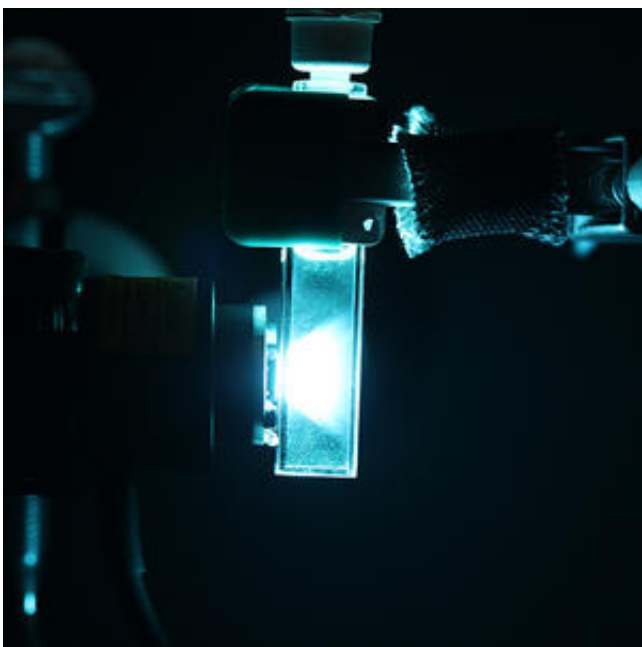


Excited state proton transfer catalysis allows scientists to observe basic chemical reactions

February 3 2016



An example of excited state proton transfer catalysis. Credit: Ken Hanson

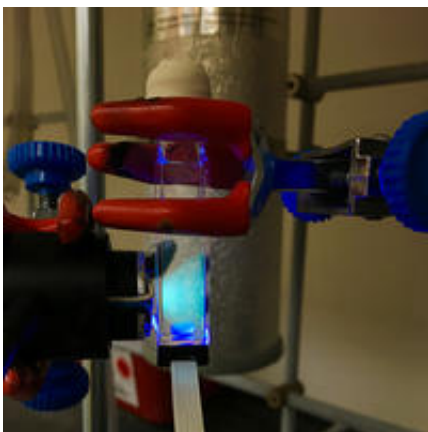
What if light—or the lack thereof—could start and stop a chemical reaction in its tracks, giving scientists a freeze frame approach to study and control some of the most basic chemical reactions?

That's the premise that Florida State University researcher Ken Hanson is exploring through a new process his lab developed that uses light to drive reactions. It's called excited state proton transfer catalysis.

"We can turn on or off the reaction with a [light switch](#)," said Hanson, assistant professor of chemistry and biochemistry. "The reaction can even be performed by simply putting the reaction mixture in sunlight, the greenest of all [alternative energy sources](#)."

The research was published in the journal *Chemical Communications* and was featured on the back cover of the journal.

The reaction relies on certain non-acidic molecules that can become acidic after absorbing light. With light, they undergo a change that makes them 10 billion times more acidic than they are without the light. That change is greater than the difference between water and [hydrochloric acid](#).



"These results open the door to an entirely new class of light-driven chemical reactions that are low cost, nontoxic and can be driven by sunlight," Hanson said.

This increased acidity, as well as the ability to stop and start a [reaction](#)

opens up huge doors for scientists in numerous domains of research including light-driven 3-D printing, photodynamic therapy and drug synthesis.

Provided by Florida State University

Citation: Excited state proton transfer catalysis allows scientists to observe basic chemical reactions (2016, February 3) retrieved 20 April 2024 from <https://phys.org/news/2016-02-state-proton-catalysis-scientists-basic.html>

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