Synchrotron gives insight into green energy enzymes

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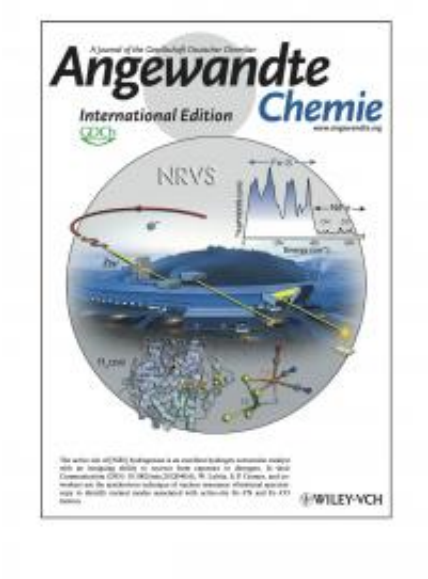

(Phys.org)—UC Davis chemists have been using a Japanese synchrotron to get a detailed look at enzymes that could help power the green economy. The work was published online Nov. 8 by the journal *Angewandte Chemie* and is featured on the cover of the Nov. 26 issue.

One option for powering clean, environment friendly vehicles is to run them on hydrogen fuel rather than carbon-based fuels. Cheap catalysts to prepare hydrogen gas (H2) are key to this future "hydrogen economy."

Current man-made catalysts are based on the rare and precious metal platinum. But living cells contain enzymes called hydrogenases, based on the abundant metals nickel and iron, which can do the same job. Chemists are very interested in figuring out how these natural catalysts work and trying to mimic them.

Saeed Kamali, a postdoctoral researcher at UC Davis and Stephen Cramer, professor of chemistry have just published a study revealing new details of the iron-nickel complex at the heart of the natural hydrogenase. In collaboration with researchers at the Max Planck Institute in Germany and in the U.S., they used a technique called Nuclear Resonance Vibrational Spectroscopy (NRVS) and the SPring-8 synchrotron at the Japan Synchrotron Radiation Research Institute to probe the crystals and discovered new information about how the atoms in the complex can move.

More information: onlinelibrary.wiley.com/doi/10 … e.201204616/abstract

Provided by UC Davis