

Chemists Develop Easier Way To Find Platinum, Other Rare Metals

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Finding uses for palladium and platinum-rare precious metals coveted by the automobile, chemical, and pharmaceutical industries as catalysts in chemical reactions-proves easier than finding the scarce materials themselves.

Detection involves expensive instruments operated by highly trained chemists that take days to return results. But chemists at the University of Pittsburgh have unearthed a fast, easy, and inexpensive method that could help in the discovery of palladium/platinum deposits and streamline the production of pharmaceuticals. The research will be published online Sept. 21 in the “Journal of the American Chemical Society.”

The new method was developed in the laboratory of Kazunori Koide (Ko-ee-deh), a chemistry professor in Pitt's School of Arts and Sciences. It relies on a colorless fluorescein-based solution (similar to that used to find blood residue at crime scenes) that-under a simple hand-held ultraviolet lamp-glowes green when it comes in contact with even minute amounts of palladium and platinum, which coexist in nature.

The process takes approximately one hour as opposed to the effective but complex and days-long analysis currently employed in the mining and pharmaceutical industries, Koide explained. Moreover, the Pitt team's method can accommodate hundreds of samples at once whereas current technology analyzes samples only one at a time, Koide said.

“Our method can be used on the mining site,” he said. “And you don't need a doctorate in chemistry-anyone can do this.”

A major pharmaceutical company is currently evaluating Koide's method in detecting trace amounts of palladium in drug samples, Koide said. Although crucial in drug development, residual palladium in pharmaceuticals can be toxic, which means stringent chemical analysis is required to find this metal. Shortening the analysis to an hour will help get drugs to market faster and, in mining, find viable quantities of these essential metals.

Palladium and platinum are practically unmatched as catalysts and thus important to the chemical, pharmaceutical, and automobile industries (both are popular as jewelry, too). Palladium is most used in the catalytic converters that render car exhaust less toxic. But known palladium/platinum deposits dot only a few countries-including the United States and Canada-which makes the prices and supply unstable.

The paper can be found on the “Journal of the American Chemical Society” Web site at www.pubs.acs.org/journals/jacsat/ .

Source: University of Pittsburgh

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