

Promising Hydrogen Sensor Technology

Niigata University



Some of the best inventions are the ones that are the least expected.

Just ask Shuji Harada, Ph.D., a professor in the Institute of Science and Technology at Niigata University in Niigata, Japan.

Harada has focused much of his research on metal-hydrogen systems, an increasingly important field relating to energy storage (think rechargeable nickel metal hydrate, or NiMH batteries) and hydrogen fuel storage cell development. Several years ago, one of his students suggested that he purchase a hydrogen sensor for his laboratory, but at the time, Harada could not afford it. So, he took it upon himself to develop one himself, using funds from his annual research budget along with grant money from the Japanese government.

The end result was an extremely small, simple yet versatile hydrogen sensor device. It had an extraordinarily quick response speed — within nanoseconds — and was highly selective, picking up only hydrogen, and not other gases. It also was very sensitive, able to trace miniscule amounts of hydrogen in the air. And finally, it required no external power source.

“ Having created this marvelous device for use in his student’s lab, it dawned on the professor that it could be used to detect hydrogen gas leaks in a variety of other settings, for example, the chemical and power generation industries, the space industry, and potentially in the future fuel cell vehicle market.

With this in mind, Harada patented the device, and plans are under way to develop a business that will manufacture and market these hydrogen sensors in the future.

Harada received significant royalties from a three-year licensing agreement arranged through the Niigata Licensing Organization. Yet he donated all of the royalty money to Niigata University, so that the funds could be used to support younger researchers engaged in related fields of research. In recognition of his outstanding invention, Harada received an award from Japan’s Ministry of Education, Culture, Sports, Science and Technology in June 2006.

Harada’s devices may one day help protect, and perhaps even save the lives, of those who may be exposed to the dangers of hydrogen gas leaks in their daily work.

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