
**Institute for Integrated Cell-Material Sciences (iCeMS)
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FOR IMMEDIATE RELEASE

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News Release

Shining New Light on Air Pollutants Using Entangled Porous Frameworks

Certain types of pollution monitoring may soon become considerably easier. A group of researchers centered at Kyoto University has shown in a recent *Nature Communications* paper that a newly-formulated entangled framework of porous crystals (porous coordination polymers, or PCPs) can not only capture a variety of common air pollutants, but that the mixtures then glow in specific, easily-detected colors. Lead author for the paper was Dr. **Yohei Takashima**.

Until now, chemical sensors have generally needed to be custom-designed to recognize specific compounds, and a separate transmission mechanism was required in order to "see" that a particular molecule had indeed been successfully captured.

"We have created what amount to be interlocking jungle-gyms, that move relative to each other and are therefore able to capture molecules of varying sizes," explained Dr. **Shuhei Furukawa** of Kyoto University's Institute for Integrated Cell-Material Sciences (iCeMS).

This naphthalenediimide-based PCP, known as NDI, expands and contracts to confine air-borne volatile organic compounds (VOCs) such as benzene, toluene, xylene, anisole, and iodobenzene, which are common pollutants in the lower atmosphere.

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Dr. Yohei Takashima



Dr. Virginia Martínez Martínez



Dr. Shuhei Furukawa



Dr. Susumu Kitagawa



"When exposed to ultraviolet light, the NDI-VOC interaction luminesces in an unusually wide range of colors, sufficiently intense to be observed even with the naked eye," elaborated iCeMS Professor and deputy director, **Susumu Kitagawa**.

These findings, including contributions from Dr. **Virginia Martínez Martínez** at the Universidad del País Vasco in Bilbao, open the door to the development of a new range of portable, solid-state pollution detectors, and possibly even new types of light sources.

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About the iCeMS:

The Institute for Integrated Cell-Material Sciences (iCeMS) at Kyoto University in Japan aims to advance the integration of cell and material sciences -- both of which are traditionally strong fields for the university -- by creating a uniquely innovative global research environment. The iCeMS seeks to integrate the biosciences, chemistry, materials science, and physics to capture the potential power of meso-scale control of stem cells (e.g., ES/iPS cells) and soft functional architectures (e.g., porous coordination polymers). Such manipulation holds the promise of significant advances in medicine, pharmaceutical studies, the environment, and industry.

Publication information

Molecular decoding using luminescence from an entangled porous framework

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Also available at

- Kyoto University website:
www.kyoto-u.ac.jp/en/news_data/h/h1/news6/2010/110126_1.htm
- EurekAlert! by AAAS:
www.eurekalert.org/pub_releases/2011-01/ific-snl012311.php