

Researchers Develop New Procedure to Synthesize Quantum Dots

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Indiana University-Purdue University Indianapolis (IUPUI) researchers in the Department of Chemistry & Chemical Biology have developed a new procedure for the synthesis of “quantum dots,” as published March 31, 2006 on the Chemistry of Materials website.

Quantum dots are highly fluorescent nanoscale-sized solid particles that are finding increasing applications as imaging probes in the burgeoning field of nanomedicine. Due to their sheer brightness and high photostability, quantum dots have the ability to act as molecular “beacons.” When attached to compounds or proteins of interest, quantum dots allow researchers to track movements within biological media or whole organisms, significantly impacting the way medical professionals study, diagnose and treat diseases.

The work of IUPUI researchers will make quantum dot technology more accessible.

According to Naumann and Long, faculty within the Department of Chemistry & Chemical Biology, and article co-authors, quantum dot materials are costly and inconvenient for biomedical laboratories, as synthesis requires high-temperature techniques. The new synthesis developed at IUPUI makes use of room temperature sonochemistry to generate quantum dots that span the full range of colors in the visible spectrum.

“This new, low temperature procedure may also facilitate the large-scale

synthesis of quantum dots and allow inclusion of temperature sensitive materials in the synthesis procedure itself,” they said.

“This is very exciting research—the kind of research that will lead to improvements in medical diagnosis and to further breakthroughs in fundamental science,” said Carl Cowen, dean of the IUPUI School of Science. “This announcement is one of many we have seen and will continue to see from biomaterials researchers of the IUPUI Department of Chemistry & Chemical Biology.”

Citation: “Facile Sonochemical Synthesis of Highly Luminescent ZnS-Shelled CdSe Quantum Dots” M. J. Murcia, D. L. Shaw, H. Woodruff, C. A. Naumann, B. A. Young & E. C. Long: pubs.acs.org/cgi-bin/abstract. ... p/abs/cm0505547.html

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