speed of tuning (about 1 minute) and the fact that no mechanical motion, such as rotating the crystals, is required.

The team concluded by noting that a $KGd(WO_4)_2$ crystal can be rotated by 90 degrees to produce a different set of Raman-shifted wavelengths from the 1064 nm fundamental. They speculated that with only minor adjustments the same double-LBO-crystal scheme combined with this alternative orientation could produce a different set of frequency-mixed laser wavelengths, which could be useful for certain wavelength-specific applications.

COLIN MCCORMICK

Cross-Linked Nanostructures Synthesized From Block Copolymers

Nanoparticles formed by selectively cross-linking block copolymers have attracted interest for possible use as nanoreactors and as agents for encapsulation, transduction, and drug delivery. The production of these nanoparticles is complex, requiring multiple controlled synthesis steps. Recently, however, S. Harrisson and K.L. Wooley of the Center for Materials Innovation and the Department of Chemistry at Washington University in St. Louis have developed a simplified "one-pot" technique for the synthesis of cross-linked nanostructures.

In issue 26 of *Chemical Communications* (p. 3259; DOI: 10.1039/b504313a), Harrisson and Wooley described the synthesis procedure and presented transmission electron microscopy (TEM) images of the resulting nanostructures. The synthesis begins with commodity monomers of styrene (STY) and maleic anhydride (MA). Diblock and triblock copolymers were produced by radical addition fragmentation chain transfer (RAFT) polymerization. The ratio of MA/STY/RAFT agent during this polymerization step determined the length of the copolymers.

Water was then added to the copolymer solution to form micellar aggregates. These particle assemblies were analyzed by TEM, and most showed a definite structural ordering, with micelles arranged in a rosette pattern. The observed uniform structures are intriguing for aggregates having lengths of tens of nanometers.

In the final synthesis step, cross-linked nanoparticles are formed by carbodiimide-mediated amidation. The cross-linking was confirmed by infrared spectral analysis of the cross-linked structures and their subsequent dissociation. TEM images recorded from these nanoparticles showed a further increase in microstructural complexity. Measurements of nanoparticles in solution using dynamic light scattering agreed well with TEM measurements of nanoparticles prepared on substrates.

This work demonstrates a new method for the synthesis of cross-linked nanoparticles having well-defined structural characteristics and morphologies using a "one-pot" route. According to the research team, this advance should lead to an improved understanding of the internal structures of these assemblies and increased control over their characteristics.

ANDY FRANCIS

Single-Molecule Spectroscopy of Organic Dye Nanoparticles Explains Bulk Fluorescence

A.J. Gesquiere of the University of Texas at Austin, T. Uwanda of Osaka University, and their colleagues reported in the May 23 issue of *NanoLetters* (p. DOI: 10.1021/nl050567j) the application of single-molecule spectroscopy (SMS) to