Energy storage is among today’s greatest technical challenges, and chemists are playing a leading role by developing new materials to improve battery technology for automotive and power grid applications. In one of the latest advances, an academia-industry team has designed a high-performance battery that uses nascent silicon and heavier group 14 radical compounds as anode materials (Angew. Chem. Int. Ed. 2013, DOI: 10.1002/anie.201308302). The researchers, led by Akira Sekiguchi of the University of Tsukuba and Hideyuki Nakano of Toyota Central R&D Labs, both in Japan, have been exploring new materials for making lithium-free batteries. In the current work, they focused on crystals of the radical compounds (R2R’Si)3E, where R = tert-butyl, R’ = methyl, and E = Si, Ge, or Sn. They mixed the radical compounds with carbon black to make anodes and then paired the anodes with a graphite cathode. During the charge-discharge cycle, the radicals are reduced to form anions and then oxidized to re-form radicals. The anodes have a larger energy density than standard dual graphite batteries, with the silicon radical providing the best performance. “This is a nice example of a potential application for compounds that were hardly believed to exist at ambient conditions 10 years ago,” Sekiguchi says.