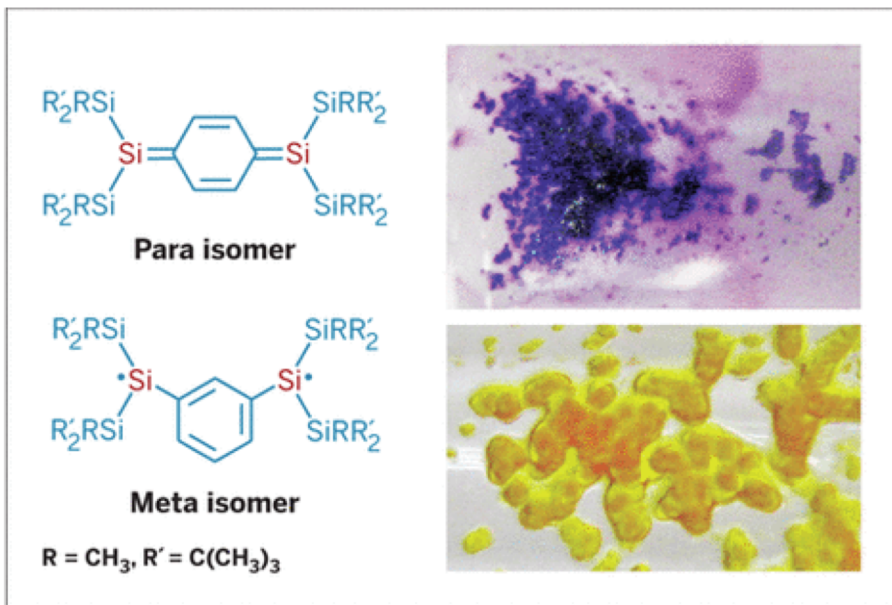


Silicon Radicals Double Up

Using carbon analogs as a guide, a Japanese team has synthesized the first stable silicon diradical species



Using carbon analogs as a guide, Takeshi Nozawa, [Akira Sekiguchi](#), and coworkers of Japan's University of Tsukuba have synthesized isomeric *p*- and *m*-disilaquinodimethanes, the latter of which represents the first stable silicon-based diradical species (*J. Am. Chem. Soc.*, [DOI: 10.1021/ja2014746](#)). Organic free radicals featuring an unpaired electron on a carbon atom are used in a variety of chemical reactions, but versions with two or more radical centers, of interest for making organic magnetic materials, are more challenging to make and stabilize. Isolable silicon, germanium, tin, and lead single radicals have also been reported, but oligoradicals containing these elements have remained elusive until now. Sekiguchi's group used *p*- and *m*-quinodimethane derivatives as model compounds: The para isomer takes on a quinonoid form and has a nonradical singlet ground state, whereas the meta isomer has a biradical triplet ground state. When the researchers made the silicon analogs, the *p*- and *m*-disilaquinodimethanes, they observed the same behavior. In the para isomer, conjugated Si=C bonds form, but in the meta isomer, the silicon 3p and carbon 2p orbitals can't overlap, preventing π bonding. The two compounds have noticeably different spectra—the para isomer is purple and the meta isomer is yellow—and display different reactivities.