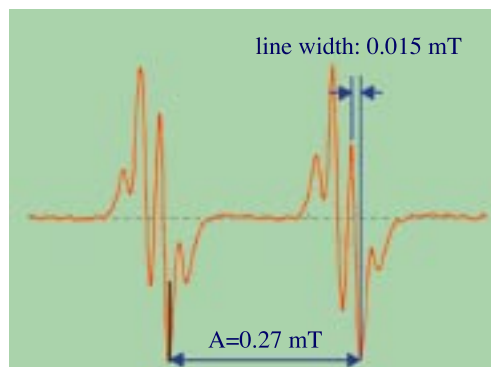
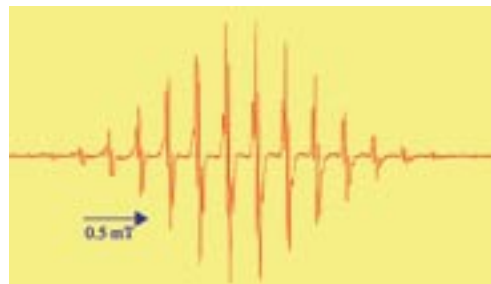


A Reference Material for Electron Spin Resonance

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Perfluoro-2,4-dimethyl-3-isopropyl-3-pentyl is an extremely stable free radical due to six bulky CF_3 substituents protruding above and below the radical center like 'picket fences'. Two 'picket fences', each comprising three trifluoromethyl groups, protect the radical center against various active molecules. Due to inert nature of the radical it could be used as an internal standard for the electron spin resonance (ESR) measurement. The highly congested 'picket fence' geometry hinders the three C_3F_7 groups from rotating around the three bonds next to the radical center. As a result, the ESR spectrum has a beautiful hyperfine structure (Fig. 1). Since this hyperfine structure is significantly influenced by magnetic field homogeneity and/or modulation amplitude, we propose this radical as the indicator testing for both spectral resolution and sensitivity of the ESR spectrometer.



Structure and ESR Spectrum of Persistent Perfluoroalkyl Radical

Mechanical Engineering and Manufacturing Technology

A Robot Spray Painting Simulation System on a Component-Based Software Framework

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We have developed a new robot spray painting simulation system with easy-to-customize capability. In order to make it easy to customize the system according to each robot's characteristics, the main algorithms for calculation of motion were developed as a component with specific functions on the component-based software development and operation framework, called MZ Platform, which was developed by the Digital Manufacturing Research Center. As the simulation system was constructed by combining the different components, a function of the simulation can be easily changed by replacing the components. The cooperative use with other applications on MZ Platform is also possible.



Robot Spray Painting Simulation System On MZ Platform