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RADICAL DENDRIMERS

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Our interest is focused on the study of molecular materials based on radical dendrimers and their magnetic and/or electric properties as well as their possible biomedical applications. Dendrimers are a very special class of hyperbranched macromolecules, which are synthesized step-by-step to ensure a good monodispersed. The three-dimensional structure of these molecules proceeds from the central core with exponentially increasing number of repeated units and terminal groups. The term radical dendrimers have been used in the case of highly functionalized dendrimers with organic radicals. There are only few examples of fully functionalized dendrimers with organic radicals to study the magnetic behavior. Here we present a series of dendrimers built with phosphorus as branching points and with nitroxyl radicals as end groups. Molecules with many unpaired electrons, which possess high-spin ground state and stability at room temperature, are particularly challenging and promising targets. The interaction between pendant stable radicals at the exterior of the dendritic surface and their dynamic behavior can be studied using Electron Paramagnetic Resonance (EPR) spectroscopy. This is important to understand the magnetic properties of these functionalized dendrimers. We describe several generations of phosphorus dendrimers with stable radicals' end groups as well as the crystal.

BIOGRAPHY

José Vidal Gancedo is tenured Scientist at the Materials Science Institute of Barcelona, ICMAB-CSIC and at the Networking Research Center on Bioengineering, Biomaterials and Nanomedicine, CIBER-BBN, Barcelona, Spain. He is Scientist in charge of the ICMAB Electron Paramagnetic Resonance Laboratory and Secretary of The Spanish Electron Paramagnetic Resonance Group, GERPE. He co-authored more than 140 journal articles and book chapters and four patents and his H-factor is 32. His research interest focuses on molecular functional materials based in organic radicals, molecular nanoscience, and nanomedicine.

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