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Impacts of conformational geometries in fluorinated hydrocarbons

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Research in blood substitute formulations is gaining more attention in the scientific community in recent years as more pharmaceutical companies start clinical trials on different artificial blood approaches. In general, artificial blood consists of emulsions of different liquid or protein compounds to increase oxygen solubility and transport capabilities as well as to decrease toxicity to biological tissue. Two of the more promising approaches center themselves around hemoglobin-based carriers or fluorinated microemulsions. Despite setbacks regarding clinical tests and medicinal approval of recent formulations, an emulsion named Fluosol was successfully approved by the U.S. Food and Drug Administration in 1989 (New Drug Application N860909). The main oxygen carrier in Fluosol, perfluorodecalin, is part of the family of perfluorocarbons. They have a wide range of applications ranging from tissue oxygenation to post-operative treatment. Their wide range of extraordinary properties, like high density, high viscosity, high biological and chemical inertness and the high gas solubility, create opportunities for the applications in biomedicine and physical chemistry as well as a high interest for scientific development. Few experimental studies based on photoelectron and X-ray absorption spectroscopy have already been performed, but the development of more complex theoretical models and new experimental techniques give opportunities for further investigation of perfluorocarbons.

Biography

Tim Brandenburg is a PhD candidate who started to work on his thesis in September 2013. His Master of Science was received at the Freie Universität Berlin working on resonant inelastic X-ray scattering dynamics on fluorinated decalin. Beforehand, he studied nanostructured thin cobalt surfaces and self-deposited thiol on nanostructured gold surfaces.

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