

フェムト秒レーザーによる炭素フリー鉄ナノ粒子の合成

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Synthesis of Bare Iron Nanoparticles from Ferrocene Hexane Solution by Femtosecond Laser Pulses

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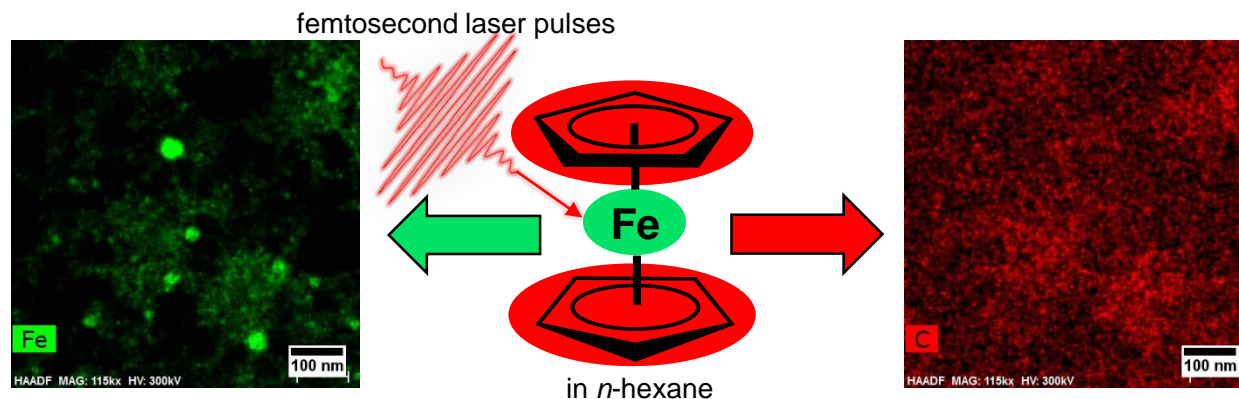


Figure 1 Femtosecond laser irradiation of ferrocene in hexane (middle) and EDS elemental mappings of iron (left) and carbon (right).

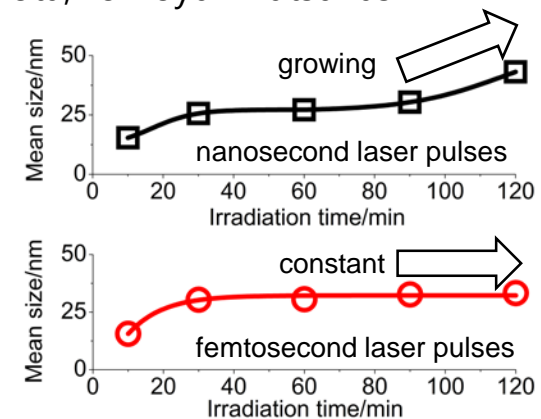
T. Okamoto, *et al.*, *ChemPhysChem*, DOI: 10.1002/cphc.201800436. より引用.

Figure 2 The time evolution of the mean size of spherical iron nanoparticles.

有機鉄錯体溶液へパルスレーザー照射を行うと添加剤を用いずに鉄ナノ粒子を生成できるが、粒子は炭素に覆われてしまう。本研究では、フェロセンヘキサン溶液へのフェムト秒レーザー照射によって炭素殻をまとわない鉄ナノ粒子の合成に成功した。さらに、フェムト秒レーザーでは長時間レーザーを照射しても粒子径が一定に保たれることを見出した。Iron nanoparticles (FeNPs) were synthesized from organoiron complex solution by pulsed laser irradiation without the aid of additive reagents. However, the FeNPs are usually covered with carbon shells. In this study, we synthesized carbon-shell-free FeNPs from ferrocene hexane solution by femtosecond (fs) laser pulses. In the case of fs-laser irradiation, the size of FeNPs remained constant even by the long-term laser irradiation.