

研 究 主 論 文 抄 録

論文題目       STUDY ON THE SYNTHESIS OF MACROCYCLIC COMPOUNDS  
                  USING MANGANESE(III)-BASED OXIDATIVE RADICAL CYCLIZATION  
                  (マンガン(III)に基づく酸化ラジカル環化反応を用いる大環状化合物の  
                  合成に関する研究)

熊本大学大学院自然科学研究科理学専攻化学講座  
                  (主任指導   西野 宏 教授)

論文提出者 伊藤 洋輔 (Yosuke Ito)

主論文要旨

《本文》 In this thesis, the oxidative macrocyclization reaction using manganese(III) acetate as an oxidant was described. The oxidation of  $\alpha,\alpha,\omega,\omega$ -tetraphenyl- $\alpha,(\omega-1)$ -alkadienes with oligomethylene bis(3-oxobutanoate)s in the presence of manganese(III) acetate was investigated, and the novel methylene-tethered macrodiolides from twelve to sixty-two members were synthesized in good to moderate yields. A plausible mechanism for the macrocyclization was discussed. A similar reaction of oxamethylene-tethered terminal dienes with the bis(3-oxobutanoate)s gave the corresponding crown ether-type macrodiolides in acceptable yields. Since it was suggested that the cyclophane-type compounds may be available using the oxidative radical cyclization, the reaction of terminal dienes with bis(3-oxobutanoate)s containing aromatics in the methylene chain was investigated. Fortunately, a variety of the cyclophane-type macrodiolides were obtained in good to moderate yields. Furthermore, the oxidative intramolecular cyclization of (2-propenyloxy)oligomethylene and oligooxamethylene 3-oxobutanoates, and the 3-oxobutanamides were examined. As a result, the corresponding novel macrolides and macroamides were obtained in good to moderate yields.

The detailed results of the study are given in *Chapters 2-4*, and the general procedure for the reactions and the spectroscopic data as well as the physical property of the products are given in each chapter.