

The 8th JUACEP Seminar

第8回 名古屋大学日米協働教育プログラムセミナー

“F⁻ Catalytic Rearrangements of Silsesquioxanes (SQs) and Analogs: New Cage Sizes and Unusual Reactive Properties”

Lecturer: **Professor Richard M. Laine**

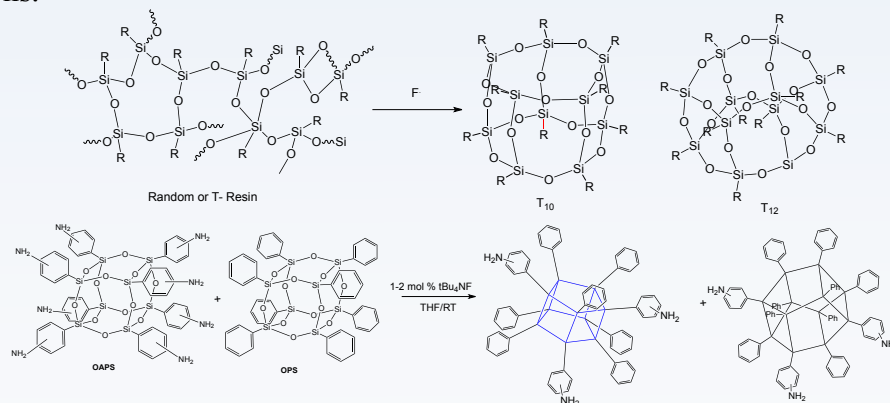
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略歴: 1969年カリフォルニア州立大学化学部卒。1973年南カリフォルニア大学博士号(化学)取得。デラウェア大、UCサンタバーバラ、スタンフォード国際研究所研究員を経て1987年ワシントンテクノロジーセンター研究教授、1990年からミシガン大学物質科学工学部教官。1999年同大教授。Mayaterials 創設者兼CEO、高分子科学工学センター統括者、EXIMOハードコーティング社共同創設者。

Date November 13, 2012 13:00~14:30

Venue Lecture room 144, Eng. Bldg.-1

We have been exploring the use of $t\text{Bu}_4\text{NF}$ as a means to transform either polymeric T resins or single functional group T₈ cages into mixed functional T₁₀ and T₁₂ SQs as illustrated in the two following reactions.¹⁻³



To this end, we have now developed simple, multigram routes to pure PhT₈, PhT₁₀ and PhT₁₂. The PhT₈ system offers cubic symmetry whereas the PhT₁₀ system offers five fold symmetry and is therefore a very unusual molecule. In contrast, the PhT₁₂ compound has no symmetry. We have also been able to identify and isolate still larger cages as will be discussed. The various cage sizes allow us to explore the effects of symmetry and size on a wide variety of properties. For example, the PhT₈ cage brominates almost exclusively in the *ortho* position. The PhT₁₀ also brominates preferentially in the same position whereas the PhT₁₂ is less selective. Modeling studies seem to explain the observed behavior. We have also used Heck catalytic cross coupling to functionalize the *ortho*-bromo derivatives of the cages and explored their photophysical properties.

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