



### **3M Lecturers:**

- 1962 **Sir Derek H.R.Barton, Imperial College**
- 1963 Sir Ronald Nyholm, University College
- 1964 F. C. Tompkins, Imperial College
- 1965 S. Winstein, U.C.L.A.
- 1966 F. A. Cotton, M.I.T.
- 1967 J. O. Hirschfelder, Wisconsin
- 1968 A. Eschenmoser, E.T.H., Switzerland
- 1969 **H. Taube, Stanford**
- 1970 S.A. Rice, Chicago
- 1971 F.H. Westheimer, Harvard
- 1972 R.G. Pearson, Northwestern
- 1973 W.A. Klemperer, Harvard
- 1974 G. Stork, Columbia
- 1975 R. J. P. Williams, Oxford
- 1976 J. A. Morrison, McMaster
- 1977 D. Arigoni, E.T.H., Switzerland
- 1978 J. Chatt, Sussex
- 1979 **J. A. Pople, Carnegie-Mellon**
- 1980 W.P. Jencks, Brandeis

**Prof. Tamao will present three lectures:**

**Tuesday, October 30th, 2007**

**4:00 p.m.**

**Auditorium B - University Hospital**

**3<sup>rd</sup> floor**

**(off connecting hallway to Dental Sciences)**

**Lecture #1 - Organosilicon Chemistry  
Directed Toward Organic Synthesis**

The most characteristic feature of silicon is an ability to form penta- and hexa-coordinate (hyper-coordinate) compounds as stable species, in contrast to carbon. We have introduced a concept to modern synthetic organic chemistry that silicon-carbon bonds are activated toward electrophiles through the formation of hypercoordinate species, and have developed some new reactions based on this concept from a synthetic point of view. This lecture will include the following topics:

1. Comparison of silicon with carbon and a brief historical survey of organosilicon chemistry
2. Silicon-carbon bond cleavage reactions of hexacoordinate organopentafluorosilicates
3. Hydrogen peroxide oxidation of the silicon-carbon bond in ordinary tetracoordinate silicon compounds to form alcohols: Development, mechanism and application to regio- and stereo-selective polyol synthesis
4. Functionalized silyl anions: from stable aminosilyl-lithiums to silylenoids and sila-ylides

**Contact**

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**Wednesday, October 31st, 2007**

**4:00 p.m**

**3M Building - Room 3250  
(adjacent to Somerville House)**

**Lecture #2 - Elemento-Organic Chemistry  
Toward Materials Science**

While elemento-organic compounds, i.e., organic compounds containing heavy main group elements, have widely been used as synthetic reagents, they have scarcely been used as functional materials, especially electronic materials, except for a broad range of silicone industrial products and conductive polythiophenes. We have been interested in the photophysical properties of certain elemento-organic compounds from both viewpoints of basic science and practical application. This lecture will include the following topics:

1. Silole-containing pi-conjugated systems: Synthesis, electronic properties and application as an efficient electron-transport material for electroluminescent devices.
2. Photophysical property control based on the coordination number change of trianthryl-boron, silicon and phosphorus compounds: colorimetric sensing of a fluoride ion
3. Sigma-conjugated oligosilanes: Conformation dependence of the photophysical properties

**Coffee and Donuts will be served  
15 minutes prior to the talks outside the  
lecture room.**

**Thursday, November 1st, 2007**

**4:00 p.m.**

**3M Building - Room 3250  
(adjacent to Somerville House)**

**Lecture #3 - Transition Metal Catalyzed  
Cross-Coupling Reactions: Discovery of the  
Nickel-Phosphine-Catalyzed Cross-  
Coupling Reaction and Some Recent  
Advancements**

The nickel-catalyzed cross-coupling reaction between C(sp<sup>2</sup>)-halides and Grignard reagents, reported in 1972 independently by R. Corriu's group in France and by our group in Japan, has some advantages over the widely used palladium-catalyzed cross-coupling reactions. The most characteristic feature is that aryl chlorides and even aryl fluorides can be used as the coupling partners.

In this lecture, I will present a story of discovery of the Ni-phosphine catalyzed cross-coupling reaction in our group in 1972 and some recent advancements which include:

1. Ni- and Pd-catalyzed cross-coupling reaction of polyfluoro-arenes
2. Pd-catalyzed cross-coupling of aryl-triazenes with arylboronic acids or aryl-trifluorosilanes
3. The common key role of a Lewis acid to activate the strong Aryl-F and Aryl-N bond in these cross-coupling reactions.

Our website: <http://www.uwo.ca/chem/>