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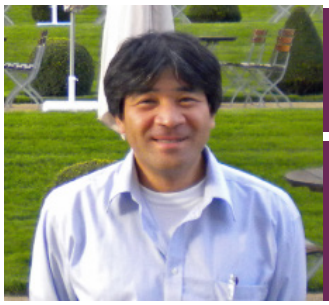

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Design of Efficient Molecular Catalysts for Development of Polymeric Functional Materials

Design of molecular catalysts plays an essential role for synthesis of (advanced) functional materials with unique properties. In this lecture, several examples developed in our laboratory will be briefly introduced.

Metal catalyzed olefin coordination/insertion polymerization is a core technology for polyolefin production. Recently, considerable attention has been paid to the synthesis of new polymers that cannot be prepared by ordinary catalysts. Nonbridged half-titanocenes containing anionic donor ligands, Cp'TiX2(Y) (Cp' = cyclopentadienyl, Y = aryloxo, ketimide etc.), are promising catalysts for syntheses of new polymers by ethylene copolymerizations especially with sterically encumbered olefins (believed to be traditionally unreactive), cyclic olefins.[1,2]

Olefin metathesis is a useful method applied for synthesis of various polymeric, advanced materials. In particular, ring-opening metathesis polymerization (ROMP) has been employed for synthesis of various functional materials; both Ru-carbene (Grubbs type) and Mo-alkylidene (Schrock type) catalysts are the successful examples. (Imido)vanadium(V)-alkylidene complexes are also the promising catalysts;[3] the fluorinated phenoxy analogue exhibited the notable activities,[4] and the fluorinated alkoxo analogues demonstrate *cis* specific ROMP even at 80 °C.[3,4]

Acyclic diene metathesis (ADMET) polymerization is the effective method for synthesis of defect-free conjugated polymers, and the method enables an introduction of functional groups at the chain ends.[5] We demonstrated that the method using Mo catalysts enables quantitative introduction of different end groups into the polymer chain ends.[6]

Wednesday 8 November 2017 at 4.00 P.M.

COFFEE AND TEA WILL BE SERVED AT 3.45 P.M. IN FRONT OF THE SOLVAY ROOM

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