

高分子学会九州支部外国人研究者講演会

**Novel Thermoplastic Elastomers
with Complex Macromolecular Architectures**

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日時： 2012年1月24日（火） 14:30 - 16:00

場所： 長崎大学 文教キャンパス
総合教育研究棟 多目的ホール

King Abdullah University of Science and Technology (KAUST)のNikos Hadjichristidis教授は、高真空アニオン重合により、化学構造が精密に設計制御された複雑な構造を有するブロック共重合体、多分岐高分子や dendrimer などの合成、さらには、これらの高分子の構造と力学物性の関係の解明に及ぶ研究で、著名な研究者です。今回、福岡を訪問の際、長崎大学にもお立ち寄りいただき、ご講演をいただくことになりました。多数ご参加いただけますようご案内申し上げます。

Abstract

Model graft and block-graft co/terpolymers of styrene, isoprene and butadiene with tri-, tetra and hexafunctional branched points, randomly or regularly placed along the backbone, were synthesized using anionic polymerization high vacuum techniques and chlorosilane chemistry. Molecular characterization carried out by SEC (UV and RI detectors), low-angle laser light scattering, differential refractometry and NMR spectroscopy confirmed the high degree of molecular and compositional homogeneity of the synthesized materials. The morphological and mechanical properties of these materials were investigated by TEM, SAXS and mechanical testing. The structure/morphology relationship for graft copolymers may be understood by applying Milner's model to the constituting miktoarm star. The observed morphology is independent of the functionality of the branch points but the extent of long range order decreases with increasing number of branch points. The strain at break of these materials can greatly exceed those of commercial thermoplastic elastomers (e.g. Kraton and Styroflex). Architecturally induced changes in morphology provide a powerful means to manipulate the mechanical properties of graft copolymers and thus to design novel and more efficient thermoplastic elastomers.

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