



UNIVERSITÀ DEGLI STUDI DI NAPOLI "FEDERICO II"

Dipartimento di Scienze Chimiche

*Dottorato in Scienze Chimiche - XXXIV Ciclo*

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**Research Doctorate (Ph.D.) in Chemical Sciences**

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### ***Project Information***

#### **1 - Title**

Structural characterization of olefin-based multiblock copolymers from chain shuttling technology.

#### **2 - Key words**

Chain shutting technology, olefin based multiblock copolymers; thermoplastic elastomers; structure properties relationships, microphase separation vs. crystallization.

#### **3 - Abstract**

The aim of the project is of understanding the molecular architecture of olefin based multi-block copolymers obtained from chain shuttling technology (CST). CST has emerged as a powerful tool for the efficient production of ethylene/olefin multiblock copolymers (EOBCs) characterized by a statistical distribution in block length and numbers of blocks per chain and unique properties of materials with high melting temperature, low density and elastomeric properties. The process relies in the use of two organometallic catalysts with different ability toward comonomer incorporation, and a chain shuttling agent (CSA), such as diethylzinc, able to provide the reversible transfer of the growing chains between two catalytic centers. Although EOBCs from chain shuttling technology have faced the scientific community since 2006 and nowadays constitute an important class of thermoplastic elastomers, to date, their chain microstructure is still deceptive. In this project we propose to set up a multidisciplinary approach for the assessment of the basic structural parameters of EOBCs, with the final goal of understanding their properties at molecular level.