



***Ph.D. School in Chemical Sciences  
Cycle XXXVIII***

**Proposer/Company:** Professor Claudio De Rosa/Lamberti S.pA.

**Research project title :**Alternative synthetic strategies for the production of water based isocyanates-free polyurethanes that are sustainable for the environment and in terms of industrial and economic scalability

**Key words:** Polyurethanes, Isocyanates, sustainable chemical synthesis

**Research project abstract:** Conventional polyurethanes involve the use of isocyanates and polyols. The preparation of isocyanates require the use of hazardous and toxic phosgene. Isocyanates are also labeled as toxic, irritating (skin and eye), sensitizing (skin and respiratory system), dangerous for the environment and sometimes carcinogenic. Workers who use isocyanates to manufacture polyurethanes may be at risk of exposure by inhalation or by skin absorption. Applying polyurethane products (varnishes, paints, coatings) could also release isocyanates. Therefore, the use of alternative synthetic strategies that do not involve the use of isocyanates represents a great challenge for industries and for the company Lamberti that produces water dispersion polyurethanes (PUD). The objective of the project is the evaluation of alternative routes to the production of PUD that do not use isocyanates or other substances dangerous for human health and the environment and that are sustainable in terms of industrial and economic scalability