CORSO DI “ELEMENTI DI CHIMICA VERDE E SOSTENIBILE”

Verifica scritta del 7 Luglio 2014 (II parte)

1) With reference to polymeric materials consisting of a) PET and b) phenol-formaldehyde resins, highlight the methodologies for their mechanical or chemical recycling or for energy recovery. Explain why containers for liquid foods are made only by the first type of polymeric materials, despite the higher cost.

2) After having given the appropriate definitions and provided examples, indicate which methods are applicable for disposal/recycling of biodegradable polymers and compostable polymers?

3) Which quantitative information is needed to define the Risk Management Cycle and the Eco-toxicological profile of a Chemical Product?

4) Describe briefly benefits and limits of the two most abundant C3 building blocks as sources of new commercial products and materials.

5) “PLA and PHA are polymers which belong to the class of polyesters. They have close but not identical structures, meanwhile the first are synthetic and the second are natural polymers, but both are relatively easily biodegraded when composted.” Explain with structural formulas and reactions the different aspects of the sentence.

6) Terpenes are secondary nonfood metabolites of great potentialities in the context of biorefinery. Explain with examples the bases of this sentence.

7) How are classified very dangerous chemicals within the EU REACh legislation? Which data must be provided to the EU Agency if the production of the compound is higher than 10 tons per year?

*8) Give examples of adoption of criteria for Inherently Safer Processes, including design for safety, in the chemical field.

**8) Give examples of adoption of criteria for Inherently Safer Processes, including design for safety, in the environmental field.

*9) Heterogeneous catalysis is now a duty for both chemical and biotechnological industrial processes. Which are the reasons for this trend and how to address the problems of recovery and disposal of catalysts?

**9) Make examples of application of biocatalysis in the environmental field and clarify in what sense this differs from the use of biotechnology.

*10) Process intensification is strongly looked for in modern processes for production of chemicals. Make examples of what the term means and which tools are used to reach its targets.

**11) In what areas do you expect that the current research in the fields of equipment miniaturization will have future outcomes in the environmental field?

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*Chem. Eng. students

**Env. Eng. students