

Questions for the mid-term evaluation
Panel: Technology and environmental protection

Part 1: Chemical synthesis on a technical scale

1. Discuss the most important problems related to scaling-up from the laboratory to the technical stage.
2. Based on the ammonia synthesis, discuss technological solutions used in industrial installations leading to optimal thermodynamic and kinetic conditions for the process performance.
3. What are the functions of catalysts used in motor vehicles? Explain in what form the car catalysts are used and why.

Part 2: The challenges of sustainable chemistry

1. Discuss structure, properties and the resulting applications of surfactants and the role of surfactants as eco-toxicants and the active compounds in water and soil remediation.
2. Discuss the importance of chemical sciences in achieving the goals of sustainable development - what is sustainable development, what are its goals, how do the research in the field of chemical sciences contribute to achieving these goals - discuss on selected examples.
3. Discuss lipid monolayers and bilayers as models for studying the mechanisms of the toxicity of various xenobiotics (advantages and limitations of using these models, methods of their investigations)

Part 3: Sustainable Li-ion energy storage technologies

1. Discuss the principles of green chemistry rules for designing sustainable materials technologies.
2. Discuss the full value chain for the selected chemical product.
3. Discuss the scale-up process of materials technology.
4. Discuss the material and energy balance for the selected active material (cathodic or anodic).