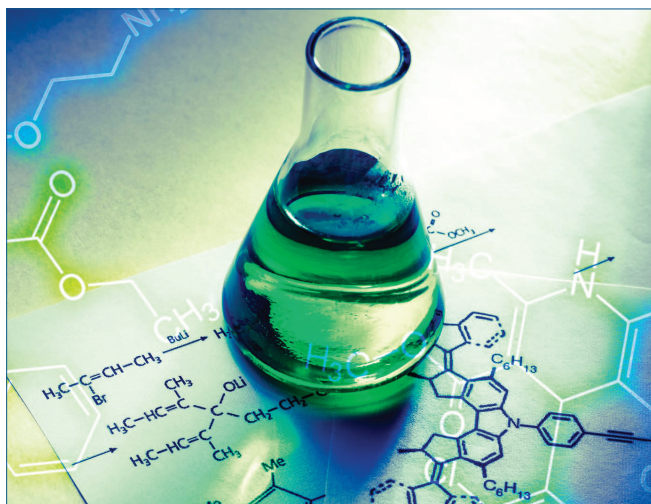




SUSTAINABILITY OF PRODUCTS

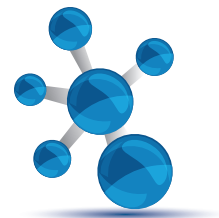
The workshop aimed to foster the interaction between Industries and Research Institutions to address the challenge of sustainability of products. The Industries have presented their needs, strategies and results in the field, the Research Institutions their idea, tools and results in a new communication modality that makes more effective to bridge idea to innovation.



The WS5 of CIS 2019 "Sustainability of the Product" has been organized by Federchimica and the Division of Industrial Chemistry of the Italian Chemical Society.

The topic of sustainability of products is a focus area of chemical production addressing a main challenge facing the industry and society. Although chemistry and chemical production has been certainly one of the driving factors leading to our current style of life, with innovation in chemistry the engine for this development, there is an increasing societal push towards reducing the impact created by the production and use (including end-use) of the many goods needed for our style of life. Although chemistry is producing the materials which are then used from the manufacturing industri-

al area to produce these goods, and thus is producing the tailored materials requested from this manufacturing sector, including aspect such as life time, it is also evident that the negative aspects related to end-of-use of the goods is typically attributed to chemical rather than to the manufacturing sector, as should be made. Recyclability of goods is not equivalent to the recyclability of the materials constituting the good, because often the main issues derive from the presence of composites 'fit for use' rather than 'fit for sustainability'. Sustainability of the products thus means to rethink design of goods, and of the materials composing them, which require thus a systemic approach between knowledge in chemical control of the materials properties (fundamental and applied chemical research) to tailored industrial production in terms of material characteristics (including aspects such as reducing waste in manufacturing process) and goods manufacture (including design 'fits for sustainability', for example a design which include end-of-use transformation or recycle). It is thus clear that a key element towards sustainability is to create a virtuous path of communication between all the different actors and stakeholders involved in this objective, create a common strategy and a long-term vision. This is the objective and relevance of WS5, and in general of CIS 2019. Only by fostering a better exchange of idea, capabilities and a more precise identification of the objectives it is possible to foster the transformation to a more



sustainable economy, as required from the society, especially the younger generation, with an increasing push. This is why a more effective synergy, starting from a better communication, between chemistry, industry and society actors is needed. Sustainability of products also imply to move from a linear to a circular production, where wastes are not discharged, but are the feed for other productions. Also in this case, this concept of circularity or circular economy, which is at the core of the next EU Framework Programme Horizon Europe, requires not just to consider the single steps, but to have a global vision, with enhanced intersectorial communication and across the 'idea to innovation' path.

Thus, the area indicated as "sustainability of products" is an important element of the strategy to a sustainable economy, where it is necessary to foster a stronger link and improved communications between the three components: chemistry, industry and society. It is an area identified as crucial in the next EU Horizon Europe framework programme and thus also an opportunity to obtain financial support to work together between the fundamental, applied and industrial components of chemistry. The WS5 area was thus identified in joint collaboration between Federchimica and the Division of Industrial Chemistry as the main theme around which focuses the discussion. Specifically, in the workshop the attention has been focused on the waste use as raw material for production of new products (end of waste) and on new products

and processes with lower impact on the environment. More specifically, three were the main aspects discussed:

- i) the design of new products taking into account the entire life cycle;
- ii) the use of the wastes for the production of new products;
- iii) the design of smart products that are able to decrease the environmental impact of human activity and industrial production.

The workshop has been structured in 6 keynote lecture, 13 oral presentations, and 22 posters. There was a significant participation from both academic and industrial sides, with intense debates within the workshop, but also out (during coffee breaks and lunch) due to limited time available. As a general comment, it can be indicated that this was a successful workshop creating the seeds for positive further collaborations, but also showing to the many young researchers presented at the workshop the opportunities for new research areas.

The opening lecture was made from G. Iaquaniello (Nextchem Srl) with the keynote lecture "Municipal solid wastes valorisation through their conversion into syngas". NextChem is a new society of Maire Tecnimont group dedicated to explore the novel opportunities and processes for circular economy and energy transition. Ing. Iaquaniello showed that the merger between the waste management and chemical industry is an interesting example of circular economy and represent a fundamental step



to create a greater and more sustainable future allowing a better (re)-use of resources and energy. As a specific example, he presented the new venture with Eni to create two new waste-to-H₂ or waste-to-methanol plants in Porto Marghera and Livorno, respectively.

The legal problems of the End of Waste were discussed in the keynote “End-of-waste: EU legislation, ECJ-case law and main open issues” by D.A. Röttgen (Ambientalex). In this keynote the approach held by the EU as well as by single Member States when enacting end-of-waste legislation has been highlighted together with the main difficulties and open issues Member States as well as operators are currently facing when approaching and putting into place EoW.

The relation of Franco Amelio (Deloitte) pointed out the capacity of Global Reporting Initiative (GRI) Sustainability Reporting Standards in giving to stakeholders more transparent, consistent and reliable information about sustainability of organizations of all kinds.

A. Collina (Mapei Spa) in his speech “Sustainability for Mapei: facts not words” highlighted the Mapei approach to economic, environmental and social sustainability as well as the related key figures in 2018 Report, showing that Mapei is well aware that the role of a Company in our Civil Society is far greater than that of generating profits and firmly believes that Company’s reputation and credit include its ethical and scientific profile, its human and cultural background and its social commitment.

The keynote of S. Viticoli (Associazione Italiana per la Ricerca Industriale) “Responsible Research and Innovation (RRI)” pointed out that the research system for applying the principles of RRI should propose an approach to science and research policies based on societal needs, and on the involvement of societal actors, through the implementation of inclusive and participatory approaches in all phases of the research processes.

N. Ballarini (Clariant Prodotti) in the relation “The role of sustainability in the manufacture and use of catalysts” showed as Clariant has implemented a sustainability program that looks not only at pro-



duction processes, but much more broadly at their responsibility towards human beings and the world improving their production processes and making products that can play a crucial role in the creation of more sustainable value chains.

The following 13 orals and 22 posters presentation showed the existence in Italy of a strong effort in the public and industrial research centres in the development of new sustainable processes and products.

Most of these presentations has been done by young researchers, demonstrating that our country can count on their great preparation and enthusiasm.

In conclusion, the workshop has showed that chemistry is the solution for the sustainable growth, but that it is necessary to catalyse the mutual interaction between idea and innovation, starting from new, more effective, modalities of communication between Industries, Research and Society.

Sostenibilità dei prodotti

Lo scopo del workshop è stato di favorire l’interazione tra le industrie e gli istituti di ricerca per affrontare la sfida della sostenibilità dei prodotti. Le industrie hanno presentato le loro esigenze, strategie e risultati nel settore, le istituzioni di ricerca le loro idee, strumenti e risultati in una nuova modalità di comunicazione che rende più efficace il collegamento tra idea e innovazione.