The Alg'Chemists: fostering algae to fuel biobased chemistry

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Résumé

At the edge of the former century, multiple natural resources were used to feed the nascent chemical industries with raw materials. Some were renewable, like wood or plant crops, others were undoubtly less sustainable, like whale's fat or coal.
The uses of macroalgae for potash and iodine production, and for more recent hydrocolloid market, are well-known. However, less common applications, such as massive production of platform chemicals from seaweeds, according to the modern "biorefinery" concept, were established in the USA as early as during world-war I. The processes implemented at that time involved massive harvesting and fermentation of kelp in very large tanks which climaxed in 1917. This was, to our knowledge, the first modern algochemistry plant based on algae biorefinery.

The uses of algae around the world have greatly evolved since past century. Although high-end applications correspond still to the dominant part of final markets, new industrial uses are emerging and could impact the algae business by bringing a disruptive change in production volumes. In their move from petrochemistry to a more sustainable biobased chemistry, large industries have increased their interest in vegetal biomass as a source of raw material. The same trend has been observed for biofuels.
Given limitations of the land-based crop approach, using algal biomass is still considered an opportunity. Is modern biobased chemistry prepared to switch back forward to old recipes of algochemistry? This presentation aims at highlighting challenges & opportunities and will settle basic data for further discussions.

Mots-Clés: carbon feedstock, renewable, lipid, carbohydrate, biomaterial, polymer, chemical intermediate, biorefinery, enzyme

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