Conceptual design of biorefinery using seaweeds as biomass feedstock

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According to International Energy Agency (IEA), “Biorefining is the sustainable processing of biomass into a spectrum of marketable products and energy.” Biobased Products are chemicals & materials, but also human food & animal feed. Bioenergy includes fuels, power and/or heat. seaweeds have been considered potential biomass feedstock for biofuel since the first oil crisis. In addition, seaweeds have no lignin and have used as key ingredients for cosmetics, food and pharmaceuticals and therefore, they can be an ideal feedstock candidate for biorefinery. In this work, all possible seaweeds-based biorefinery systems are defined according to IEA classification and major conversion routes of the systems (processes) are designed conceptually using available literature data. Techno-economic analysis of the biorefinery systems are also presented. The major conversion routes of studied in this work are all biochemical conversion processes including fermentation and anaerobic digestion. The final products are ethanol and mixed alcohol, respectively.