

Review

Is It Possible for Biomass Direct Liquefaction to become an Eco-Friendly and Fully Sustainable Process?

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The purpose of this brief opinion essay is to provide the viewpoint of an individual who sees bio refineries as a crucial instrument for a more promising future. The absence of suitable substitutes for organic solvents is one of the outstanding problems. Nonetheless, biorefineries are a resource that we may improve and pass on to following generations.

Keywords

Environmentally friendly; Biorefineries; Byproducts; Chemicals; Biomass.

INTRODUCTION

Finding alternate raw material sources to fossil fuels is particularly important now that environmental concerns are high on the policy agenda, carbon dioxide emissions are under more constant and stricter control, and new regulations are being planned for the coming years. The environmental effect and high market value of oil barrels are two reasons why these second sources are likely to become scarce and costly.

Despite the fact that the bio-refinery idea is neither novel or particularly “out of the box”, research into it has lagged behind expectations. One of the primary reasons to explain this point is the substantial initial expenditure that is often required. The reality is that firms do not always have the financial means to handle such investments. But if we look at the big picture and consider that a lot of the raw materials that could be utilized in bio-refineries are either completely worthless as feedstock or even that companies get paid to get rid of them, we can see how bio-refineries could become a popular option in the future. The types of waste that are readily accessible in the area should be considered in the biorefinery projects such well as their seasonality which means that those projects must contemplate the versatility of the installation to be built. Concerning the direct liquefaction of wastes in acid medium, it is usual to consider this procedure a sustainable process, which in principle is not entirely wrong. However, in all truth, there is still an obstacle to be overcome, so we can, in fact, consider direct liquefaction as a fully sustainable process. The reader at this time may become a little bit bewildered with this last statement. However, we must be aware

of one point, which may be regarded as a drawback of this procedure. The use of organic solvents, including the use of polyhydric alcohols, which are often, produced products that result from fossil sources, are still a barrier that must be torn down, so the process becomes fully sustainable. We have beheld some remarkable and frankly positive advances over the last years with the exploitation of natural and renewable sources. Regarding the lignocellulose residues, many compounds can be accessed from these sources. From fuels and value-added chemicals to substrates for the production of bio products through fermentation or even antioxidant additives, among many others, this process can become a new source of income for companies that are generating these wastes and decide to take the step needed and invest in bio refineries to valorize the wastes created from their production line. If we consider the life cycles of raw materials and products obtained from the direct liquefaction we may outline, not a simple, closed and carbon dioxide neutral cycle, but a complex web of interconnected cycles which altogether can form a neutral carbon dioxide emission system, as well. Although to make all the involved processes of those cycles fully sustainable, petroleum-free formulations' components are extremely needed. The use of solvents from natural sources or industrial wastes as well could and should be considered. The downstream solvents employed in chemical industries, such as pharmaceuticals, fine chemicals could also be a solution. That will allow not only the elimination of very expensive treatments that usual are needed to eliminate such residues and at the same time making feasible at acceptable costs the...

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