Review

Dry fractionation process as an important step in current and future lignocellulose biorefineries: A review

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Dry fractionation process as an important step in current and future lignocellulose biorefineries: A review

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Abstract

The use of lignocellulosic biomass is promising for biofuels and materials and new technologies for the conversion need to be developed. However, the inherent properties of native lignocellulosic materials make them resistant to enzymatic and chemical degradation. Lignocellulosic biomass requires being pretreated to change the physical and chemical properties of lignocellulosic matrix in order to increase cell wall polymers accessibility and bioavailability. Mechanical size reduction may be chemical free intensive operation thanks to decreasing particles size and cellulose crystallinity, and increasing accessible surface area. Changes in these parameters improve the digestibility and the bioconversion of lignocellulosic biomass. However, mechanical size reduction requires cost-effective approaches from an energy input point of view. Therefore, the energy consumption in relation to physicochemical properties of