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A Review of Advances in Bioethanol Production Processes from Oil Palm Empty Fruit Bunch

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Abstract : Many studies are carried out in different countries to find alternatives of hydrocarbon-based fuels,1 which include hydro, wind, biofuels, solar, and geothermal energy. One of the major biofuels isbioethanol, a clear, colorless liquid, biodegradable, and lowin toxicity, and can be considered as a high-octane fuel oroctane enhancer in domestic petrols. The pre-treatment process for oil palm empty fruit bunches (OPEFB) or empty fruit bunches (EFB)for produce bioethanol require convert the complex lignocellulose structures into enzymatically digestible forms and easy handling for use. The pre-treatment can to be divided into physical, chemical, biological and physico-chemical tre-treatment. Various studies on the subject are presented below either a single treatment or combination of several. Nevertheless, the most important problem with bioethanol downstream processing is the dewatering step due to azeotropic formation during distillation of ethanol-water mixtures. Currently, different methods like direct contact membrane distillation (MDBR), extractive batch distillation, pervaporation, adsorption, molecular sieve and pressure Swing Adsorption (PSA) are used for bioethanol dehydration with regard to the absolute ethanol production. Also, mass and energy integration processes are also reviewed.
Keywords : bioethanol, pretreatment, process integration, purification.

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