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Valorization of Sugarcane Bagasse to a Platform Chemical Levulinic Acid catalysed by 1- Butyl - 2, 3 - Dimethylimidazolium Tetrafluoroborate [BMMim] [BF4]

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PURPOSE OF THE ABSTRACT

Globally, we are experiencing the effects of climate change due to natural sources and human activities which releases greenhouse gases, therefore, there is a need for sustainability. In this work, a fossil fuel resource was replaced by a renewable resources, bagasse which is a sugarcane industry waste. The bagasse was used as the starting material for the production of levulinic acid (LA) and an environmentally friendly catalyst 1-butyl-2, 3-dimethylimidazolium tetrafluoroborate [BMMim][BF4] was used (Fig. 1). The Box-Behnken design (response surface methodology) was used to design the set of experiments with three variables, namely, time, temperature and [BMMim][BF4] loading. The investigated conditions were: temperature (100 - 220 oC), time (2 ? 12 h) and [BMMim][BF4] loading (1?4 g) and the optimum conditions were found to be 100 oC, 7 h, and 4 g of [BMMim][BF4] which yielded a maximum LA amount of 12704.9 ppm. The effect of solvent on the LA production was studied and different yields were obtained for different solvent used indicating that the solvent have an effect on LA yield. The reusability test showed that [BMMim][BF4] can be used for more than five times without losing it activity.

FIGURES

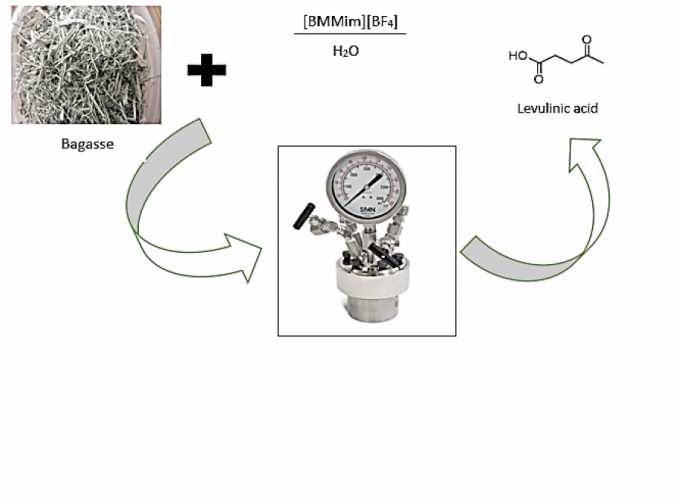

FIGURE 1

Figure 1. The production of levulinic acid from bagasse using [BMMim][BF4]

none

FIGURE 2

KEYWORDS

sugarcane bagasse | Levulinic acid | Ionic liquids | Optimization

BIBLIOGRAPHY