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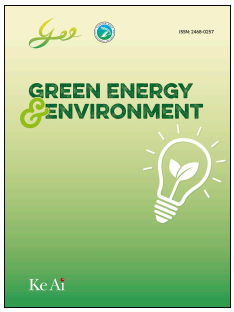

Efficient and recyclable Rh-catalytic system with involvement of phosphine-functionalized phosphonium-based ionic liquids for tandem hydroformylation-acetalization

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Efficient and recyclable Rh-catalytic system with involvement of phosphine-functionalized phosphonium-based ionic liquids for tandem hydroformylation-acetalization

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KEYWORDS: Phosphines; Phosphonium-based ionic liquids; Bi-functional ligands; Recyclability of homogeneous catalysts; Tandem hydroformylation-acetalization

ABSTRACT

The phosphine-functionalized phosphonium-based ionic liquids (**dppm-Q**, **dppe-Q**, **dppp-Q** and **dppb-Q**) as the bi-functional ligands enable the efficient one-pot tandem hydroformylation-acetalization. It was found that, in **dppm-Q**, **dppe-Q**, **dppp-Q** and **dppb-Q**, the incorporated phosphino-fragments were responsible for Rh-catalyzed hydroformylation and the phosphoniums were in charge of the subsequent acetalization as the Lewis acid catalysts. Moreover, the diphosphonium-based ionic liquid of **dppb-DQ** could be applied as a co-solvent to immobilize the Rh/**dppb-Q** catalytic system with the advantages of the improved catalytic performance, the available catalyst recyclability, and the wide generality for the substrates.