Efficient tool for organic reactions: preparation of building blocks

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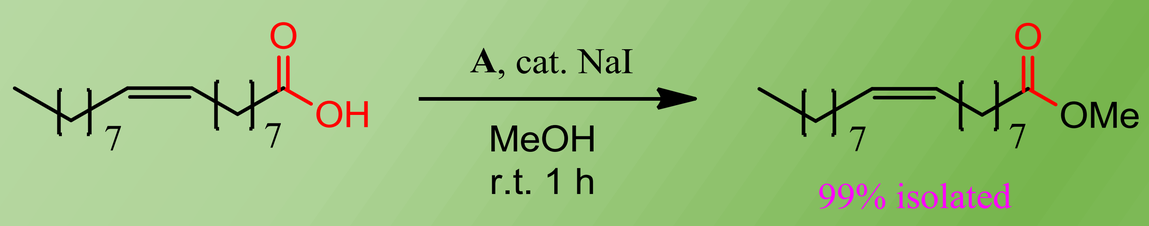
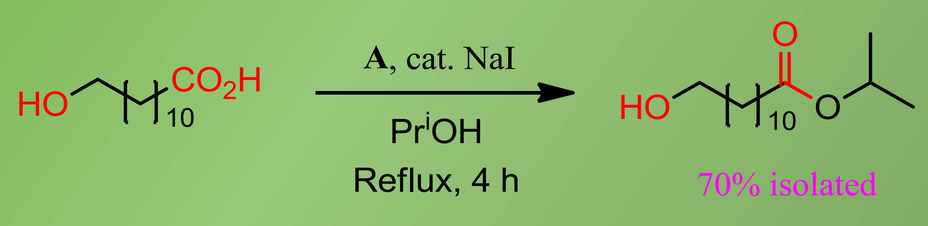
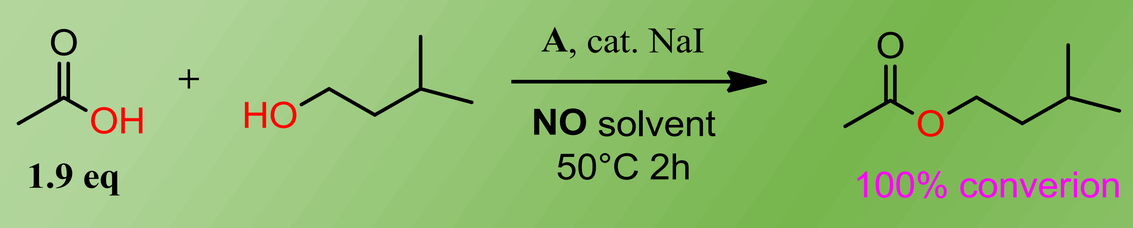
Introduction

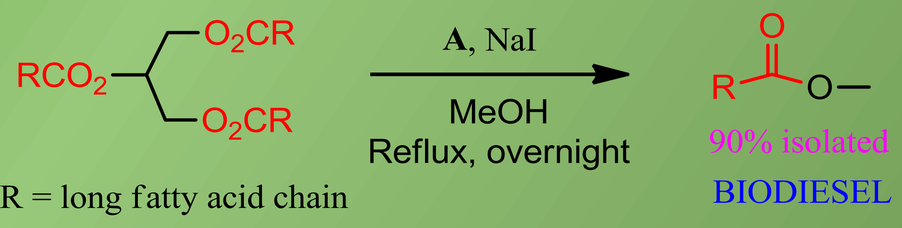
Nowadays, green chemistry methods and technologies are more and more common demand for industrial processes to reduce waste and eliminate the use and generation of hazardous substances. We have recently described a novel multipurpose tool to perform organic reactions in solutions based on dried Dowex H^+ (**A**) and NaI either as reagent or catalyst.[1,2] Discovered method enables to perform organic reactions more decent conditions and easy isolation of products. Some of the typical examples of these reactions are collected below, like esterification reactions in extremely mild conditions, opening of oxygen containing heterocyclic rings to iodoalkanols to be used as building blocks for the synthesis of more complex molecules e.g. medicinal chemistry purposes. Also selective substitution of primary HO-group to ether structure in the presence of other types of secondary HO-groups has been demonstrated. Additionally, preparation of biodiesel from used cooking oil is possible.

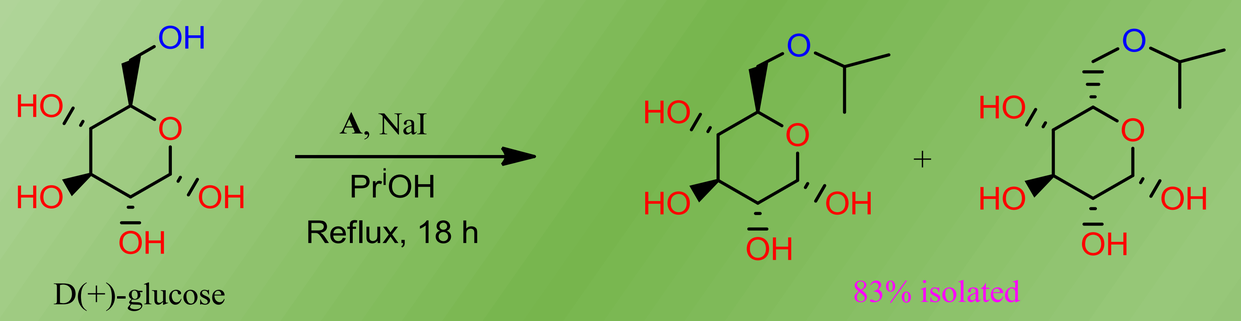
Reaction examples

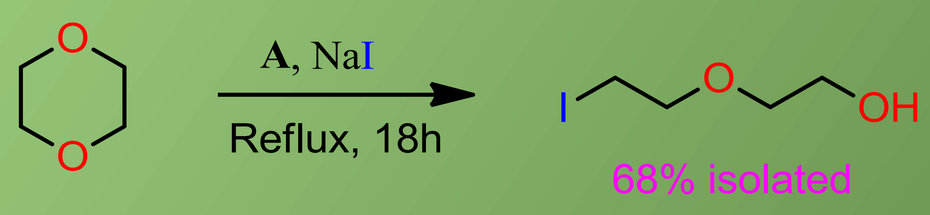


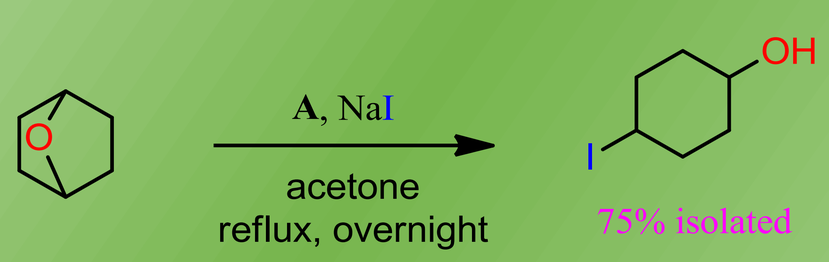


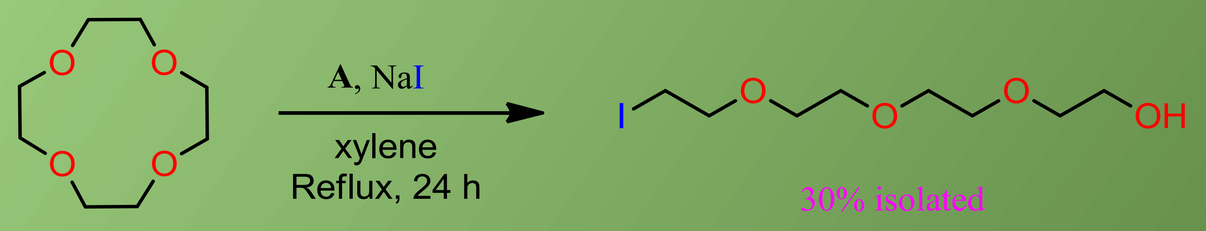












Results and Discussion

Maybe the most common reaction in organic chemistry is esterification reaction. Above there can be seen the examples of esterification reactions performed in room temperature or with hindered alcohol and also without solvent by using our discovered method. Also the triglycerides can be transesterified to biodiesel. Selective etherification of D(+)-glucose was successful without any protection steps.

Ethylene glycols of different sizes are highly important linkers to optimize the properties of molecules[3,4]. Here we describe some examples of preparation of haloalkanols from cyclic ethers, like 1,4-dioxane or even 12-Crown-4 ether. 4-iodocyclohexanol is highly interesting building block for preparation of more complex molecules and optimizing their properties for e.g. medical use, because many drugs have cyclohexyl structure[5,6] and 4-iodocyclohexanol is not commercially available according to the SciFinder search.

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