Advisory Board Grant Report 2015-2016
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"Acetylation of Alcohols and Phenols Using Acetic Anhydride Catalyzed by Metallic Hydroxides"

The acylation of alcohols is an important transformation in organic synthesis. Despite a number of precedents, new efficient methods are still in demand, especially those that utilize reagents and methods that are cheaper and more environment-friendly. Current improvements also seek to provide easy and efficient methods of recover the final products. In this study, nine alcohols and six phenols were acetylated using acetic anhydride in the presence of lithium and potassium hydroxide. The products from these reactions were isolated, purified, and characterized using standard organic chemistry methods.

Table: Each number represents a different alcohol. Alcohols 1-9 and phenols 10-16 were reacted with an acetylating reagent in the presence of either catalyst 1 (lithium hydroxide) or catalyst 2 (potassium hydroxide). The efficiency of the catalysts was evaluated by measuring by the amount of product recovered expressed as percentage of the total expected. The time needed to complete the reactions ranged from 1-3 hours. All reactions were carried out at room temperature.

Alcohol or phenols	Catalyst	Amount of reaction product isolated (%)
1	1/2	87/75
2	1/2	90/95
3	1/2	89/80
4	1/2	90/85
5	1/2	80/76
6	1/2	90/86
7	1/2	85/80
8	1/2	95/95
9	1/2	78/80
10	1/2	95/90
11	1/2	79/85
12	1/2	82/88
13	1/2	91/78
14	1/2	82/75
15	1/2	92/88
16	1/2	75/90

These data show that the two hydroxides of lithium and potassium are good promoters of this reaction. The amount of pure products ranged from 75%-95%.

Three alcohols and two phenols produced unexpected results and require further investigation. One alcohol did not generate any product. A manuscript is in preparation and will be submitted for publication.