

"Surface-Mediated Reactions. 6. Effects of Silica Gel and Alumina on Acid-Catalyzed Reactions." Kropp, P. J.; Breton, G. W.; Craig, S. L.; Crawford, S. D.; Durland, W. F.; Jones, III, J. E.; Raleigh, J. S. *Journal of Organic Chemistry* 1995, 60, 4146.

Abstract: Absorption of a variety of acids to chromatographic silica gel results in substantial enhancement of their catalytic activity – affording easily prepared, environmentally benign heterogeneous acids that are highly effective in mediating a number of processes. This was shown for the isomerization of allene **1** and dimerization of the corresponding 1,3-diene **2**; cyclization of (*R*)-citronellal (**5**), the related diester **10**, and 1,5-cyclooctadiene (**15**); Rupe rearrangement of alkynol **18**; and Friedel – Crafts cyclodehydration of alcohols **21**. By contrast, commercially available Nafion-H was significantly less effective as a heterogeneous acid catalyst. Chromatographic alumina displayed enigmatic behavior, showing enhanced acidity on the adsorption of HCl but little or no acidity on the adsorption of a variety of other types of acid. The results are discussed in terms of the surface structures of silica gel and alumina.