Preface to the Series

There is natural selection in the synthetic organic laboratory. Successful reagents find their way into specialized journals and tend to populate researchers' benches. Sometimes, old species—like active manganese dioxide in the oxidation of unsaturated alcohols—are so well adapted to a certain reaction niche that they remain unchallenged for a long time. On other occasions, a successful new species—like Dess Martin periodinane—enjoys a population explosion and very quickly inhabits a great number of laboratories. On the other hand, the literature is filled with promising new reagents that fell into oblivion because nobody was able to replicate the initial results on more challenging substrates.

This series, which consists of a collection of monographs on basic reactions in organic synthesis, is not primarily aimed at specialized researchers interested in the development of new reagents. Rather, it is written with the objective of being a practical guide for any kind of scientist, be it a chemist of whatever sort, a pharmacologist, a biochemist, or whoever has the practical need to perform a certain basic synthetic operation in the quickest and most reliable way. Therefore, great emphasis is given to those reagents that are employed most often in laboratories, because their ubiquity proves that they possess a greater reliability. Reagents appearing in only a few publications, regardless of promising potential, are only briefly mentioned. We prefer to err on the side of ignoring some good reagents, rather than including bad reagents that would lead researchers to lose precious time.

The books from this series are meant to be placed near working benches in laboratories, rather than on the shelves of libraries. That is why full experimental details for important reactions are provided. Although many of references from the literature are facilitated, this series is written with the aim of avoiding as much as possible the need to consult original research articles. Many researchers do not have scientific libraries possessing numerous chemical journals readily available, and, many times, although such libraries might be on hand, it is inconvenient to leave the laboratory in order to consult some reference.

Our aim is to facilitate practical help for anybody preparing new organic compounds.

Preface

There is a common view among organic chemists that simple functional group transformations are a mature technology away from the forefront in the Art of Organic Synthesis. This is undoubtedly not the case in the conversion of primary alcohols into carboxylic acids. An ideal reagent for such transformation should be (1) reliable and efficient with regard to all molecules, including complex structures possessing oxidation-sensitive functional groups, (2) cheap, and (3) environmentally friendly. There is no such reagent, even if we limit ourselves to the more mundane need of anything able to provide a certain much-needed carboxylic acid, regardless of price and ecology. This state of affairs is highlighted by the fact that in forty percent of cases the oxidation of primary alcohols to acids is performed using a two-step procedure via the corresponding aldehydes; something that proves that the oxidation of alcohols to aldehydes is a much more mature technology than the oxidation of alcohols to carboxylic acids.

This monograph is a laboratory guide for the transformation of primary alcohols into carboxylic acids. It displays a panorama of the state of the art for this functional group transformation, highlighting the weaponry currently available for scientists and areas where further progress is needed. In conformity with the rest of the series, a selection is made to include those procedures that have proved more reliable in many laboratories around the globe.

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A Guide to Current Common Practice
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