

# SYNLETT Spotlight 195

## Oxalyl Chloride: A Versatile Reagent in Organic Synthesis

Compiled by David Rodrigues da Rocha



This feature focuses on a reagent chosen by a postgraduate, highlighting the uses and preparation of the reagent in current research

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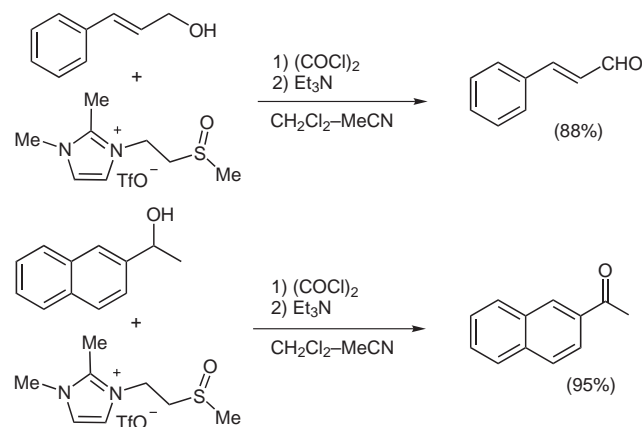
### Introduction

Oxalyl chloride is a very versatile reagent extensively used by organic chemists. One of its most common uses is in oxidation of alcohols to aldehydes and ketones named Swern oxidation.<sup>1-5</sup> However, this reagent can efficiently be applied in many other reactions such as 1,1-cycloaddi-

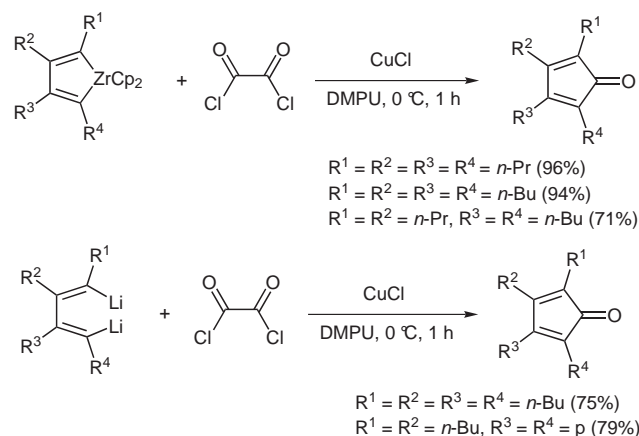
tions with 1,4-dilithio-1,3-dienes or zirconacyclopentadienes,<sup>6</sup> cyclization of 1,3-bis(trimethylsilyloxy) alk-1-enes to isoelectronic acids,<sup>7</sup> preparation of phenyl isocyanates from anilines,<sup>8</sup> bicyclization of biaryl acetamides,<sup>9</sup> dehydration of formamides to afford nitriles,<sup>10</sup> and cyclization of 1,1-bis(trimethylsilyloxy) ketene acetals to give 3-hydroxymaleic anhydrides.<sup>11</sup>

### Abstracts

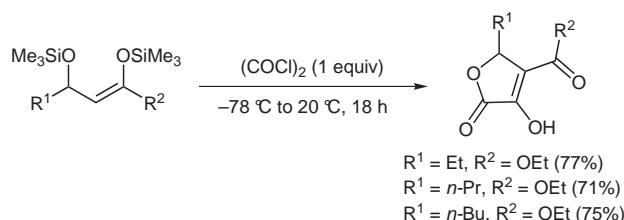
(A) He and Chan showed a new class of odorless and non-volatile organosulfur compounds anchored on imidazolium ionic liquid, which can be used effectively for the oxidation of alcohols to aldehydes and ketones in the presence of oxalyl chloride<sup>1</sup> under Swern oxidation conditions.<sup>2</sup>



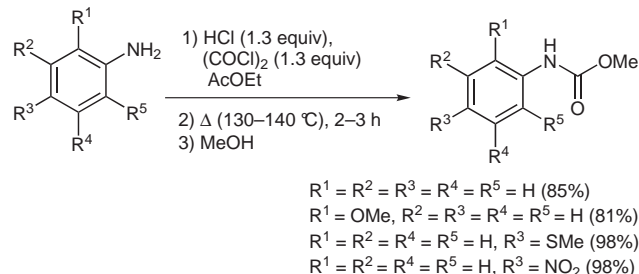
(B) Chen and workgroup reported a 1,1-cycloaddition of oxalyl chloride with 1,4-dilithio-1,3-dienes or zirconacyclopentadienes in the presence of CuCl and DMPU to afford cyclopentadienone derivatives in good yields.<sup>6</sup>



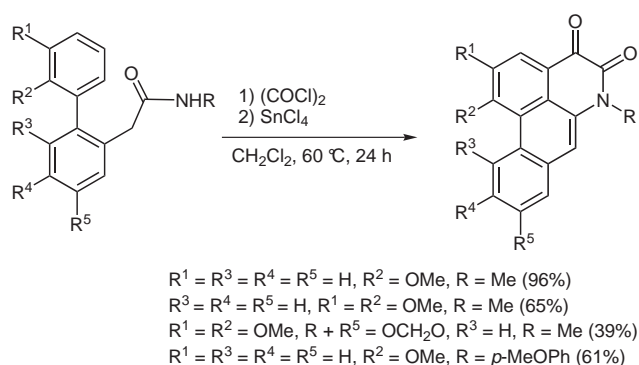
(C) Dede et al. showed a regioselective preparation of isoelectronic acids by cyclization of 1,3-bis(trimethylsilyloxy)alk-1-enes with oxalyl chloride in moderate yields.<sup>7</sup>



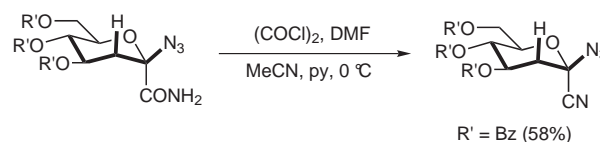
(D) Oh et al. reported a new and convenient method of generating phenyl isocyanates from anilines using oxalyl chloride. Acylation of a variety of substituted aniline hydrochlorides with oxalyl chloride affords the intermediate oxamic chlorides, which smoothly undergo thermal decomposition to the corresponding desired products.<sup>8</sup>



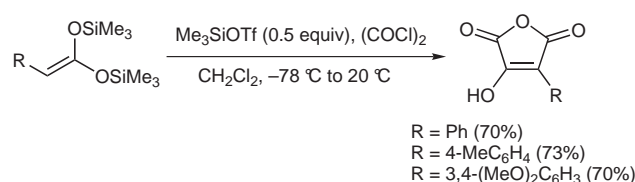
(E) Suau et al. showed that oxalyl chloride is a good promoter for bicyclization of a variety of biarylacetamides in the presence of  $\text{SnCl}_4$ , which were used for the synthesis of aporphinoids.<sup>9</sup>



(F) Czifrák et al. reported a dehydration of per-O-benzoylated C-(1-azido-1-deoxy- $\alpha$ -D-glucopyranosyl)formamide by oxalyl chloride/DMF to give the corresponding nitrile in moderate yields.<sup>10</sup>



(G) Ehsan and Langer reported the use of oxalyl chloride in the synthesis of functionalized 3-hydroxymaleic anhydrides by cyclization of 1,1-bis(trimethylsilyloxy)ketene acetals.<sup>11</sup>



## References

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