STREAMLINED CO_2 CONVERSION FOR MODERN CARBONYLATION CHEMISTRY

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Carbon monoxide (CO) is widely employed in catalytic carbonylative reactions to efficiently introduce carbonyl groups into a variety of molecules, generating a plethora of high-value fine chemicals. However, its toxicity and handling risks pose significant challenges. [1] In recent years, carbon dioxide (CO_2) has emerged as a promising, non-toxic, and abundant alternative for CO-based transformations. [2] Moreover, flow technology has revolutionised reactions involving toxic gases and hazardous chemicals, providing improved efficiency, enhanced safety, and precise reaction parameters control. [3]

Here, we present a continuous flow chemistry platform for carbonylation reactions, in which CO is *in situ* generated using the photo- and electrochemical reduction of CO_2. [4] A series of carbonylation processes were investigated under continuous flow conditions (**Figure 1**). As a result of a comprehensive assessment of parameters, we identified optimal reaction conditions that enabled rapid transformations, high selectivity, and good to excellent yields. Our findings highlight the potential of CO_2 valorisation in carbonylation chemistry and demonstrate the synergy with continuous flow technology, paving the way for safer and more sustainable carbonylation methodologies.

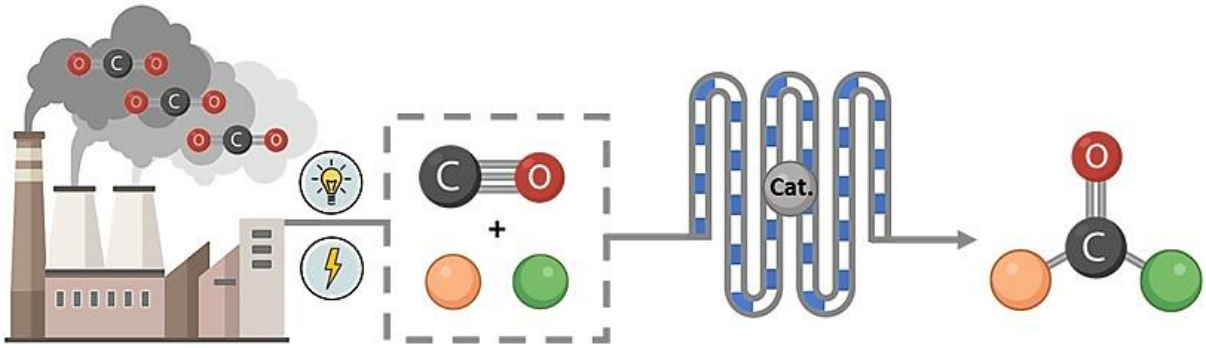

Figure 1. CO_2 utilisation and continuous flow platform for carbonylation reactions.

References

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