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TRANSFORMATION ET UTILISATION DU CO₂ : QUE PEUT APPORTER LA CHIMIE ?

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ABSTRACT

While greenhouse gases emissions are reaching alarming levels, fossil fuels still represent 80% of the world energy portfolio and 95% of our chemical commodities rely on non-renewable resources, namely hydrocarbons. In this context, utilizing CO₂ as a C1 building block to produce platform chemicals as an alternative to petrochemistry has a double advantage of reusing CO₂ while sparing fossil resources and avoiding CO₂ emissions from their use.^[1] We have developed a strategy relying on the simultaneous use of a functionalizing reagent and a reductant that can be independently adjusted to perform the reductive functionalization of CO₂. The so-called diagonal approach will be discussed and exemplified with novel catalytic processes to convert CO₂ to formamides, N-heterocycles, methylamines and methanol, using hydroboranes, hydrosilanes or formic acid as reductants.^[2] Extension of this methodology to SO₂ enables the facile conversion of this gaz to sulfones, under metal-free conditions.

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