Transition Metal Catalyzed Reactions with Carbon Dioxide

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Carbon dioxide is an abundant, non-toxic, and inexpensive reagent, an ideal feedstock for fine chemical synthesis. However, CO_2 is relatively inert. In order to make CO_2 a viable option for the chemical industry, we need to design efficient catalysts that will promote activation. We have focused our attention on using nickel and palladium salts for catalyzing the coupling between organozinc reagents and CO_2. The products are carboxylic acids. We are now working on applying this work toward the synthesis of *chiral* carboxylic acids, a common structural motif found in natural products and pharmaceutically active molecules.