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Harnessing Metal Organic Frameworks for CO2 Conversion: Unlocking New Pathways for Formate Synthesis

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Carbon dioxide (CO2) is a major greenhouse gas that significantly contributes to climate change, highlighting the urgent need for effective capture and conversion technologies [1]. This research explores the development of palladium-immobilized metal-organic frameworks (MOFs) as catalysts for transforming CO2 into formate, a valuable chemical for various industrial applications [2]. By utilizing the unique properties of MOFs, such as their high surface area and tunable pore structures, we achieved remarkable CO2 conversion rates at low temperatures [3]. The synthesis of palladium@MOF composites was optimized to enhance active site accessibility and improve catalytic efficiency. Experimental results demonstrate that these materials facilitate significant CO2 reduction under mild reaction conditions, showcasing their potential for sustainable CO2 valorisation. The results further indicate that the catalytic activity of homogeneous systems can be improved by incorporating them into MOFs as organic linkers bearing catalytic sites.

References

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