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Intermediates in the carboligation of the ThDP-dependent pyruvate decarboxylase

By Cindy Wechsler

Cuvillier Verlag Sep 2014, 2014. Taschenbuch. Book Condition: Neu. 211x149x17 mm. Neuware - As enzymatic transformations become more and more recognized as practical alternative for synthetic applications, one objective of this thesis was to contribute to the industrial synthetic portfolio with newly designed tailor-made catalysts. The main objective however was to perform a comprehensive study on the prototypical ThDP-dependent enzyme pyruvate decarboxylase to deduce mechanistic principles by which the fate of reaction intermediates are conferred. Within this thesis, mechanistic studies on pyruvate decarboxylase from *Z. mobilis* have been performed with relevance for asymmetric carboligation applications. A successful approach has been made to generate tailor-made catalysts through distinct reaction-design, based on mechanistic understanding and genetic engineering rather than on random mutagenesis. With this chemical rational, it was possible to reprogram a carboligase to an efficient and uniquely effective carboligase. Detailed analysis of the catalytic mechanism of *Z. mobilis* PDC with highly sophisticated kinetic and thermodynamic methods together with structural analysis, could delineate the stereochemical course of the reaction. 166 pp. Englisch.



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