

## Frustrierte Lewis-Paare - Neue Reaktivität durch Modulation von Lewis-Säure und Lewis-Base



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### ***Reviews***

*It is one of the best publications. It is really loaded with knowledge and wisdom. You may like the way the blogger writes this ebook.  
(Prof. Shannon Wehner PhD)*

## FRUSTRIERTE LEWIS-PAARE - NEUE REAKTIVITÄT DURCH MODULATION VON LEWIS-SÄURE UND LEWIS-BASE

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Publi In Der Okt 2013, 2013. Taschenbuch. Condition: Neu. Neuware - The concept of frustrated Lewis-Pairs (FLPs) relies on the combination of a bulky Lewis-acid with a bulky Lewis-base: the formation of the classical dative bond is prohibited by sterical reasons. The resulting ambivalent reactivity allows the metal-free activation of H<sub>2</sub> and hydrogenation catalysis. So far, FLPs have been used in the metal-free reduction of some sterically demanding and reactive unsaturated compounds. Despite the tremendous progress in this young field of research (since 2006), many open questions about the reactivity of FLPs and limitations regarding the substrate scope existed. The directed modulation of the electronic parameters of the FLP partners provides several answers to fundamental questions in this field. Against former opinions, it could be shown, that H<sub>2</sub>-activation with electron poor Lewis-bases readily occurs at low temperatures (-80°C). Using this FLPs, the unprecedented metal-free catalytic hydrogenation of olefins was established. Combined kinetic and mechanistic studies unraveled thus far controversial observations of FLPs in H<sub>2</sub>-activation and catalysis. By using a weaker Lewis-acid, a dramatic increase in functional group tolerance and reactivity in FLP catalyzed hydrogenations was achieved: The first metal-free catalytic hydrogenation of nitroolefins and acrylates was developed. By the combination of gained knowledge during these studies, the first metal-free dehydrogenative Si-N-coupling of silanes and amines was established. All herein presented findings rely on a profound comprehension of the electronic parameters of the molecules and the discovery of the transient H<sub>2</sub>-activation in metal-free catalysis. This concept was widely recognized and found use in subsequent independent applications. The development of these new metal-free catalysts allows the substitution of ecological severe and expensive heavy metals in the catalytic hydrogenation, world's largest chemical industrial process. 164 pp. Deutsch.

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