

Borametallo mimetics: Can Boron act as a Transition Metal?

Holger Braunschweig

*Institute for Inorganic Chemistry and Institute for Sustainable Chemistry & Catalysis with Boron,
Julius-Maximilians-Universität Würzburg
E-mail: h.braunschweig@uni-wuerzburg.de*

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The activation of small molecules is generally associated with transition metals (TMs) and constitutes the basis of catalysis. It was earlier believed that TM catalysts are required to facilitate processes such as the activation of H₂ and other unreactive substrates. However, recent exciting developments in main-group element chemistry have shown that carbenes, FLPs and heavy main group species are capable of TM-like activation reactions.^[1] Our ongoing studies on borylenes, diborenes, and diborynes have shown that these low-valent species exhibit a very rich chemistry, which is distinctly different from that of common compounds derived from boron in the oxidation state +3. Particularly interesting is the metal-like behavior of some borylenes and diborynes, which form CO complexes analogous to TMs, bind H₂ and unsaturated organic substrates under mild conditions and even activate N₂.^[2]

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References

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