Abstract

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Beyond Lewis Theory in the Teaching of Inorganic Chemistry

Together with simple electron counting procedures (e.g. the octet and 18-electron rules), the concept of the 2-center 2-electron (2c–2e) bond, and its representation as a solid black line between two atoms in so-called "Lewis structures", have been of immense importance in the development of chemistry. However, despite the significance of the concept of the 2c–2e bond, its limitations as a model are well-known, as illustrated by diborane, which features a 3-center 2-electron (3c–2e). Although the bonding within such molecules may be analyzed by application of either molecular orbital theory or more sophisticated theoretical methods, they lack the convenience of simple electron counting procedures in evaluating the chemical reasonableness of a covalent molecule. Fortunately, approaches for analyzing complex covalent molecules in a simple way are available, and their use in the application in the Covalent Bond Classification of molecules will be discussed.