TRANSFORMING METHYL GROUPS INTO LEWIS BASES WITH MAIN GROUP METALS

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When a methyl group is directly bound to an electronegative atom (e.g. nitrogen, oxygen or chlorine) the electron density is attracted by the later and the electron-deficient carbon atom can behave as a Lewis acid giving place to the so-called tetrel bonding. On the other hand, if the methyl group is bound to an electropositive atom (e.g. lithium, boron or aluminium), the carbon atom becomes electron-rich and can act as a Lewis base in many different types of known noncovalent interactions. This intriguing behaviour has been recently reported in hydrogen bonds (Fig. 1),[1] σ- and π-hole interactions,[2] and short methyl-alkali metal contacts in aluminates.[3]

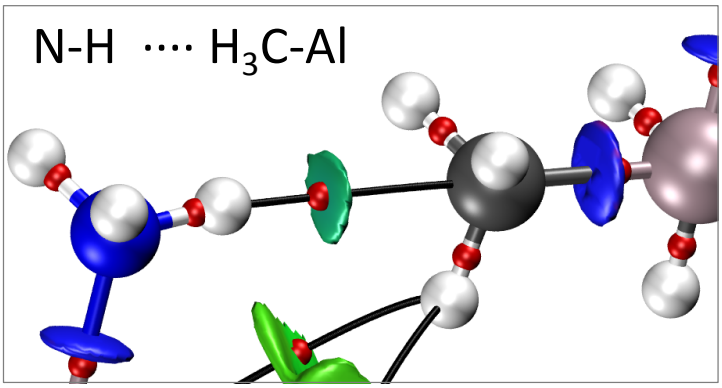

Figure 1. Topology of the electron density of a Hydrogen bond between a protic Hydrogen and an Aluminium-bound methyl group in the crystal structure of an aluminate compound.

[1] O. Loveday, J. Echeverría; *Cryst. Growth Des.*, **2021**, *21*, 5961.

[2] O. Loveday, J. Echeverría; *Nature Commun.*, **2021**, *12*, 5030.

[3] J. Damián, C. Rentero, J. Echeverría, M.E.G. Mosquera; *Faraday Discuss.*, **2023**, accepted article.