

Weak Bonding Interactions, Large Structural Impact

During the long and fruitful collaboration with F.A. Cotton many examples were encountered of how weak bonding interactions would have a very large structural impact. Often in paddlewheel and molecular wires the impact in metal–metal distances was very significant. During this lecture, the influence of such structural changes on the electronic structures of dichromium, diruthenium, ditungsten and tricobalt complexes will also be explored. As an example, answers will be provided to questions such as why the red compound $\text{Cr}_2(\text{DPhIP})_4 \cdot \text{THF}$ (DPhIP = diphenyliminopyridine) has a Cr–Cr distance ca. 0.3 Å shorter than the orange $\text{Cr}_2(\text{DPhIP})_4 \cdot 2\text{THF}$ compound, even though in solution they are identical and the interstitial solvent molecules are not located near the quadruple bonded Cr_2^{4+} unit.

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