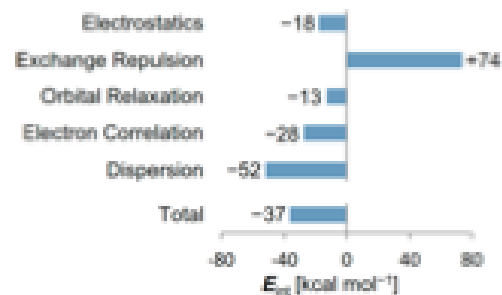


Ultrashort H...H contacts



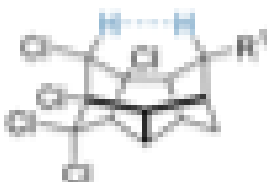
Continuously probing the limits of chemical bonding helps improve our current understanding of molecular structure theories. [1]



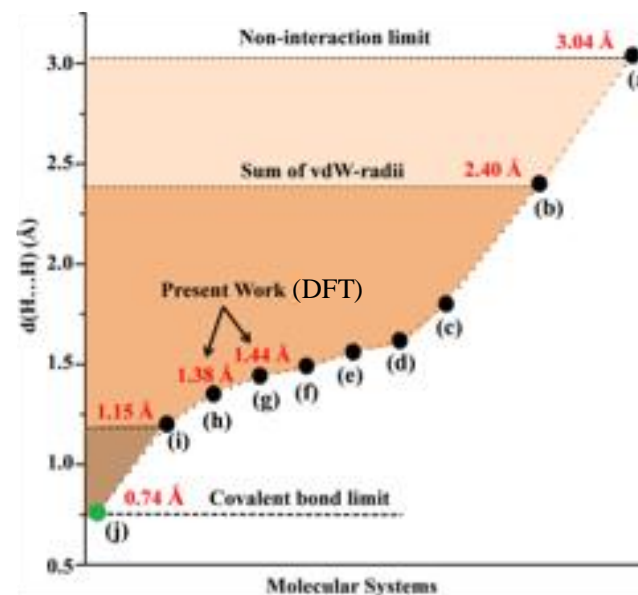
1.713(3) Å [2, NRD]



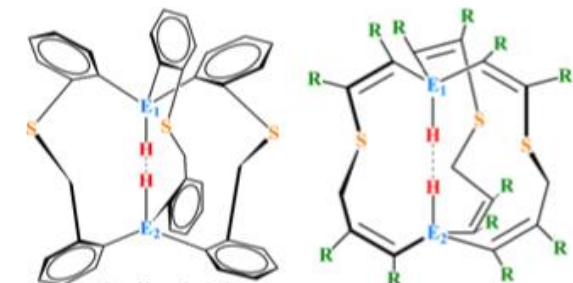
1.617(3) Å [3, NRD]



1.531(8) Å [4, NRD, unpub.]



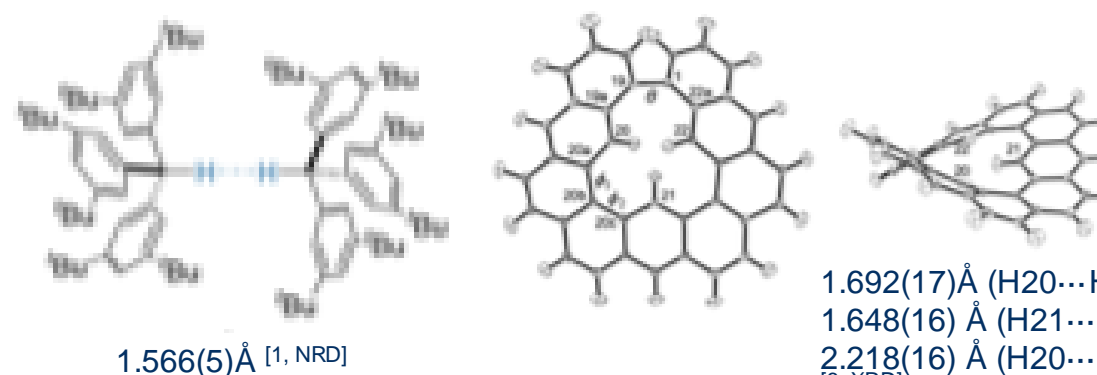
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(g) E₁ = Si, E₂ = Ge (h) E_{1,2} = Ge, R = CN

1.76(8) Å [5, XRD]

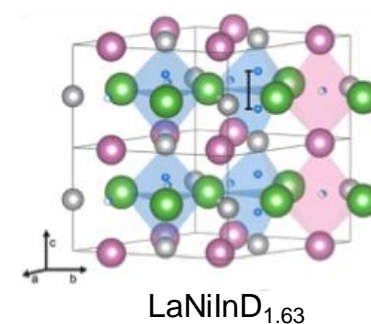
~1.5 Å [5, MP2]



1.692(17) Å (H20...H21)
1.648(16) Å (H21...H22)
2.218(16) Å (H20...H22)
[6, XRD]

The volumetric capacity in metal hydrides is fundamentally limited by an empirical *Switendick-Westlake criterion*, which defines a minimum threshold distance between the hydrogen atoms within structures of metal hydrides of ≈ 2.1 Å.

Hydride	d(H-H) (Å)
LaNiInH _{0.67}	-
CeNiSnH	2.66(1)
LaNiInH _{1.63}	1.715(1) ^a
CeNiInH _{1.4}	1.606(6) ^b
CeNiSnH ₂	2.76(1)



We envision that the results presented herein... may help guide the effort towards developing new metal hydride species with enhanced hydrogen storage capacities. [7]

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[2] Ermer & Mason, *J. Chem. Soc., Chem. Commun.* **1983**, 105, 53.

[3] Miura *et al.* *J. Am. Chem. Soc.* **1985**, 107, 2330.

[4] Pascal *et al.* *J. Am. Chem. Soc.* **2013**, 135, 13235.

[5] Pascal *et al.* *Angew. Chem. Int. Ed.* **2018**, 57, 2244.

[6] Toyota *et al.* *Chem. Eur. J.* **2024**, 30, e202401627.

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NVS = neutron vibrational spectroscopy
NRD = neutron diffraction data
XRD = X-ray single crystal diffraction