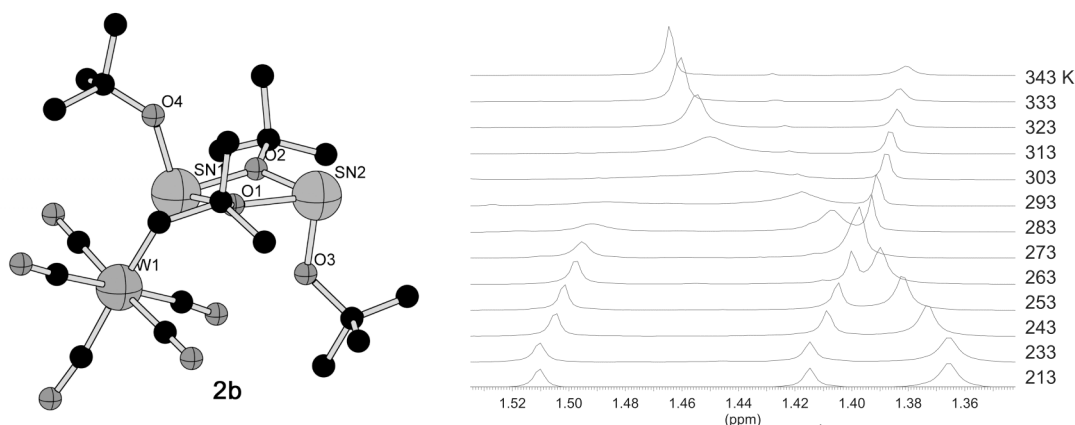


# Pentacarbonyl Complexes of Dimeric Alkoxy Stannylenes: Molecular Structures, Temperature Variable NMR Spectra and their Interrelation

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Renewed interest in transition metal complexes of stannylenes,<sup>[1]</sup> the heavier congeners of carbenes, has risen in the light of the single-source precursor concept for the bottom-up preparation of new materials,<sup>[2]</sup> and from new approaches to synthesise heteroleptic stannylenes.<sup>[3]</sup>

We present systematic x-ray analysis and heteronuclear (<sup>1</sup>H, <sup>13</sup>C, <sup>119</sup>Sn) NMR spectroscopy investigations of the dimeric alkoxy stannylene [Sn(O<sup>t</sup>Bu)(μ-O<sup>t</sup>Bu)]<sub>2</sub> (**1**) and its *mono*- and *bis*-group 6 pentacarbonyl adducts [{(OC)<sub>5</sub>M}<sub>n</sub>{(OC)<sub>5</sub>M'}<sub>m</sub>{Sn<sup>t</sup>BuO)(μ-O<sup>t</sup>Bu)}<sub>2</sub>] (n = 1, m = 0: M = Cr, W (**2b**); n=m=1: M = M' = Cr, W, M = Cr, M' = W).<sup>[4]</sup>



Molecular Structure in the solid state and temperature variable solution <sup>1</sup>H NMR spectra of **2b**.

Sterical and electronic effects can be separated by correlating systematic changes in the solid-state structures with solution NMR spectra of the complexes. The <sup>1</sup>H, <sup>13</sup>C{<sup>1</sup>H} and <sup>119</sup>Sn{<sup>1</sup>H} temperature variable NMR spectra reveal two consecutive exchange mechanisms, which involve the bridging and one or both terminal O<sup>t</sup>Bu substituents, resp. The free activation enthalpies could be determined by line shape analysis.

Based on the NMR data, an exchange mechanism is proposed.

## References:

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