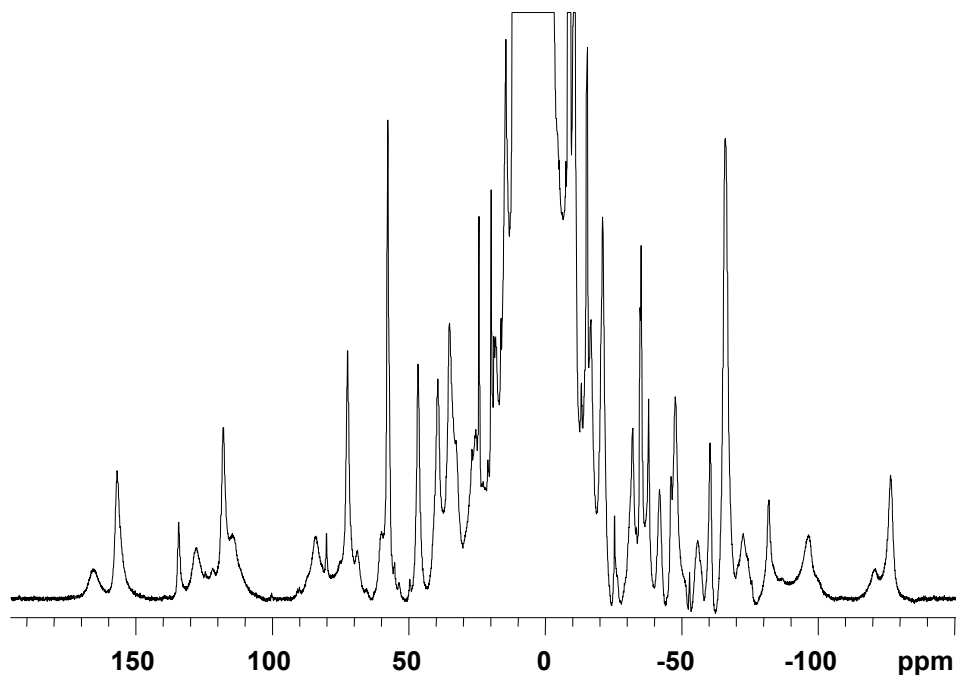


ESI- 500 MHz NMR spectrum of the dinuclear ytterbium complex.



The proton spectrum shown above illustrates the ^1H nmr spectrum of the complex Yb₂L. As can be seen, the chemical shift range of this spectrum is much greater than would be expected for a 'normal' organic molecule, due to the paramagnetic shift induced by the metal ions. This is combined with paramagnetic line broadening. In this spectrum, as in others for cyclen derived complexes, the axial protons on the macrocyclic ring are shifted furthest, while equatorial and arm protons are much less shifted. A relatively sharp peak was observed for each proton environment, together with a broader peak of roughly equal intensity somewhat shifted and in some cases partially overlapping, suggesting either inequivalent binding of the two ytterbiums, or the existence of two distinct forms of the complex in a 1:1 ratio, each having equivalent binding of the two ytterbiums.