^{1}H, ^{13}C AND ^{15}N NMR CHARACTERIZATION OF BIOMOLECULES CONTAINING $Re(CO)_3^+$ FRAGMENTS.

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The conjugation of organometallic complexes to biomolecules finds applications both in diagnostic and therapeutic fields.[1] In the case of Re(I) derivatives, the advantages is double, as it presents both radiochemical and photo-emitting properties.[2,3]
In this studies, we have reacted rhenium carbonyl derivatives with a special kind of biomolecules, namely the poly(amido-amine)s (PAAs). PAAs are a unique family of synthetic functional polymers that can be used as biomedical materials and polymer therapeutics.[4] These PAAs can be functionalized, in order to be able to covalently bind different metal fragments.
The rhenium derivatives used for this study span from the $[Re(CO)_3(H_2O)_3]^+$ complex, widely used as mimics of the hot isotope $[^{99m}Tc(CO)_3(H_2O)_3]^+$, for radio-pharmaceutical applications, to several $[Re(CO)_3(H_2O)(diaza)]^{n+/n-}$ complexes (diaza= phenantholine and/or bypiridine derivatives), used for their potential luminescence properties.
A detailed multinuclear NMR characterization of the free polymers and the rhenium complexes were undertaken, with the aim of obtaining information on which of the potential binding sites present in the polymer was involved in rhenium coordination. All the synthesized compounds have been characterized by means of 2D ^{1}H-^{13}C and ^{1}H-^{15}N HMBC and HSQC experiments, together with longitudinal relaxation experiments.
The *non* trivial results obtained by ^{15}N NMR study will be particularly emphasized in this communication.

References

[1] See for instance U. Mazzi et al, *Recent development in Bioinorganic Chemistry* 1 (2006).
[2] See for instance Zubieta J., Valliant J. F. et al, *J. Am. Chem. Soc.* **126,** 8598, (2004).
[3] See for instance R. Alberto et al, *Coord. Chem. Rev.* **190-192**, 901 (1999).
[4] Ferruti, P.; Marchisio, M. A.; Duncan, R., *Macromol. Rapid Commun.* **23**, 332, (2002).