

Subject area: ORG

NMR-based investigations on weak interactions between selenium-containing compounds and metals

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Keywords: Diselenides, Chalcogen Bond, ⁷⁷Se NMR

Highlights

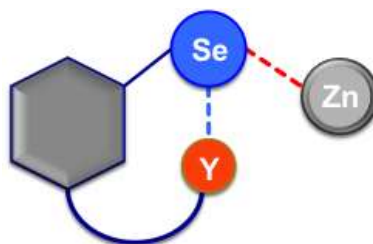
The Chalcogen bond is investigated;
Various NMR techniques were employed to discover a new weak interaction;
Zinc is chosen as prototypical of biological relevant metal

Abstract

Starting from their identification in late 1800 by Johannes Diderik van der Waals, noncovalent interactions are thought to play a major role in several research fields related to chemistry. They are indeed important in synthesis, in catalysis, in medicinal chemistry, and in the design of new materials and drugs. Among the sigma hole directed weak interactions, the chalcogen bond (CB) is surely worth mentioning for several reasons. It involves chalcogens that operate as Lewis acids accepting lone pairs with positive regions located at 180 ° from the sigma bonds.¹

Selenium containing compounds show the fascinating ability to recognize and interact with zinc containing proteins and enzymes within the cellular environment. This led us to speculate that a new, unknown weak interaction exist between selenium and zinc or zinc coordinating residues.²

Recently we engaged a research project meant to shed a light on this plausible new interaction and how it is influenced by intramolecular CB. The results obtained so far will be presented in this communication.



1. E. J. Lenardão, C. Santi, and L. Sancineto, in *New Front. Organoselenium Compd.* (Springer International Publishing, Cham, 2018), pp. 157–183.
2. L. Sancineto, A. Mariotti, L. Bagnoli, F. Marini, J. Desantis, N. Iraci, C. Santi, C. Pannecouque, O. Tabarrini *J Med. Chem.* 2015, **58**, 9601.