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Inclusion Chemistry of Thiazyl and Selenazyl Radicals in MIL-53(Al)

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Host-guest interactions have recently become a growing area of study within the scientific community, where the intrinsic chemistry affiliated with the binding and activity of these interactions can be directly correlated to the applications these complexes possess, such as gas storage materials, sensors, activators, and in heterogeneous catalysis. In particular, inclusion complexes possessing radical guests offer the potential for strong communication between both the host and guest and/or the guest molecules themselves, where the nature of the host-guest interactions lead to the effects in which the host can modify the guest properties, or conversely, the guest affects the host structure. This presentation will describe the inclusion chemistry of 4-phenyl-1,2,3,5-dithiadiazolyl (PhDTDA) radical, and its selenium analogue (PhDSDA), into the porous metal-organic framework host MIL-53(Al).

The inclusion of the PhDTDA and PhDSDA radicals into MIL-53(Al) was achieved through gas phase diffusion, and led to a colour change in the host from white to red and purple, respectively. The characterization of these inclusion complexes was confirmed through powder X-Ray diffraction and EPR spectroscopy. Reactivity studies of these radicals within the host framework will be discussed.

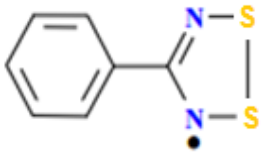

Figure 1: 4-Phenyl-1,2,3,5-dithiadiazolyl (PhDTDA)

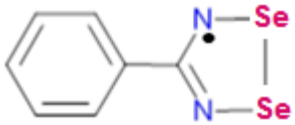

Figure 2: 4-Phenyl-1,2,3,5-diselenadiazolyl (PhDSDA)