Rational design of coordination complexes for quantum information

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Careful synthetic design of molecules and coordination materials enables the construction of systems with precise control over electronic spin location and nuclear spin distance. Harnessing the tools of synthetic chemistry we can address simple questions such as the relationship between electronic spin coherence time and nuclear spin proximity. We can progress from asking those questions to constructing materials where candidate qubits or quantum sensors are precisely positioned with atomic level reproducibility. Conferring a high level of precision to the location and orientation of quantum objects is a vital prerequisite for the design of quantum sensors and quantum information processing systems. This talk will focus on fundamental questions that can be addressed by coordination chemistry.

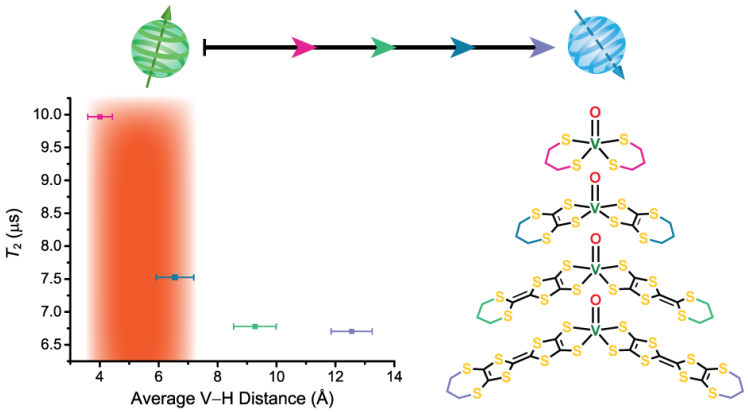

Figure 1. Coordination chemistry enables a study of the depdence of electronic spin coherence on nuclear spin proximity. Adapted from Ref 1

[1] Graham, M. J.; Yu, C.; Krzyaniak, M.; Wasielewski, M. R.;Freedman, D. E. *J. Am. Chem. Soc.***2017**, *139*, 3196–3201.

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