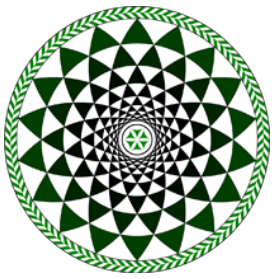

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# Critical behavior of magnetic materials studied with muon spectroscopy

*Tuesday, 4 July 2017 18:50 (20 minutes)*

Usefulness of the muon spin research ($\mu$SR) [1] in study of critical properties of molecule-based magnets, will be presented on the example of cyano-bridged molecular networks. $\mu$SR spectroscopy makes use of implanted muons to probe properties of matter at the microscopic level. The implanted muons remain in a sample until the time of their natural decay. A careful analysis of the decay positrons provides information about the interaction between spins of the implanted muons and the sample.

The $[M(CN)_8]^{n-}$ complexes [2], are universal building blocks for a molecule based magnets, leading to various spatial structures, depending on the surrounding ligands and the choice of the metal ions. With these complexes many novel, functional magnetic compounds of different network dimensionality and unique physical properties have been recently developed [3]. The $\mu$SR experimental method allows to study magnetic properties of such materials in zero applied field. Therefore it is perfectly suited to study magnetic fluctuations and spin dynamics in the vicinity of phase transition, capable to provide a set of static and dynamic critical exponents.
Examples of results obtained for several molecular magnets, based on $[M(CN)_8]^{n-}$ building blocks (M = $W^{V}$, $Mo^{V}$, $Nb^{IV}$) and *d*-electron spin centers such as $Cu^{II}$, $Mn^{II}$, $Fe^{II}$ will be shown [4,5].

References

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