



Contribution ID: 47

Type: not specified

## New perspectives in oligonuclear cyanido-bridged systems

Tuesday, July 7, 2015 10:10 AM (30 minutes)

The low dimensional cyanido-bridged species gained an extremely strong interest due to the diversity of structural coordination forms and numerous properties, prospective for future applications in data storage and processing. This could be accessible through the controlled manipulation on structural, electronic and magnetic state of the related soft materials. Several important underlying prerequisites, such as magnetic coupling and magnetic anisotropy, spin-crossover (SCO) charge-transfer induced spin transition (CTIST) and light-induced excited spin state trapping (LIESST), linkage isomerism, guest dependent behaviour and other were found and examined [1-6].

Along this line, this presentation will be focused on the ligand-ion-solvent interplay, offering the novel low dimensional Co(II,III)-CN-W(V,IV) and Fe(II,III)-CN-W(V,IV) and Mn(II)-CN-W(V) species revealing 3-nuclear, 5-nuclear and 15-nuclear structures as well as 1-D structures. The dimensionality and topology of the presented selection is not a simple case of blocking ligands. Moreover, the obtained structure-property combinations were found to correlate with the specific synthetic conditions used. As a consequence, we enrich the “magnetic offer” born by these type of compounds with: (i) combination of magnetic sponge like behaviour and chiral resolution, (ii) solid solutions with composition dependent spin phase transitions, (iii) robust porous supramolecular networks and (iv) ligand directed organization of high spin clusters for slow magnetic relaxation and magneto-caloric effect.

### References

- [1] K. E. Funck, M. G. Hilfiger; C. P. Berlinguette, M. Shatruk, W. Wernsdorfer, K. R. Dunbar, *Inorg. Chem.* **2009**, *48*, 3438–3452.
- [2] F. Karadas, C. Avendano, M. G. Hilfiger, A. V. Prosvirin, K. R. Dunbar, *Dalton Trans.* **2010**, *39*, 4968–4977.
- [3] Y.-Z. Zhang, U. P. Mallik, R. Clerac, N. P. Rath, S. M. Holmes, *Chem. Commun.* **2011**, *47*, 7194–7196.
- [4] A. Mondal, L.-M. Chamoreau, Y. Li, Y. Journaux, M. Seuleiman and R. Lescouëzec, *Chem. – Eur. J.* **2013**, *19*, 7682–7685.
- [5] B. Nowicka, T. Korzeniak, O. Stefańczyk, D. Pinkowicz, S. Chorąży, R. Podgajny, B. Sieklucka, *Coord. Chem. Rev.* **2012**, *256*, 1946–1971.
- [6] D. Pinkowicz, R. Podgajny, B. Nowicka, S. Chorąży, M. Reczyński, B. Sieklucka, *Inorg. Chem. Front.* **2015**, *2*, 10–27.

**Primary author:** Dr PODGAJNY, Robert (Faculty of Chemistry, Jagiellonian University, Kraków)

**Co-authors:** Ms HOCZEK, Anna (Faculty of Chemistry, Jagiellonian University, Kraków); Prof. SIEKLUCKA, Barbara (Faculty of Chemistry, Jagiellonian University, Kraków); Dr CHORAŻY, Szymon (Department of Chemistry, The University of Tokyo); Mr NOGAŚ, Wojciech (Faculty of Chemistry, Jagiellonian University, Kraków)

**Presenter:** Dr PODGAJNY, Robert (Faculty of Chemistry, Jagiellonian University, Kraków)

**Session Classification:** Molecular magnets