

## Research Area C ‘Molecular Nanostructures’

### Project C1 ‘Synthesis and Structural Characterization of Molecule-Based Nanostructures’

#### C1.1 ,Synthesis and Structural Characterization of Molecule-Based Nanostructures‘ (D. Fenske, A. Eichhöfer, O. Fuhr)

- [C1.1:1] \* P. Sevillano, O. Fuhr, M. Kattanek, P. Nava, O. Hampe, S. Lebedkin, R. Ahlrichs, D. Fenske, and M. Kappes, *Die phosphoranstabilisierten Gold-Arsen-Cluster  $[Au_{19}(AsnPr)_8(dppe)_6]Cl_3$ ,  $[Au_{10}(AsnPr)_4(dppe)_4]Cl_2$ ,  $[Au_{17}(AsnPr)_6(As_2nPr_2)(dppm)_6]Cl_3$  und  $[Au_{10}(AsPh)_4(dppe)_4]Cl_2$  – Synthese, Charakterisierung und DFT-Rechnungen*, Angew. Chem. **118**, 3785–3791 (2006); Angew. Chem. Int. Ed. **45**, 3702 (2006)
- [C1.1:2] S. Chitsaz, D. Fenske, and O. Fuhr, *Silberchalkogenidcluster mit Dimethylanilinmercapto-Liganden: Synthesen und Kristallstrukturen von  $[Ag_{65}S_{13}(SC_6H_4NMe_2)_{39}(dppm)_5]$ ,  $[Ag_{76}Se_{13}(SC_6H_4NMe_2)_{50}(PPh_3)_{6.5}]$  und  $[Ag_{88}Se_{12}(SC_6H_4NMe_2)_{63}(PPh_3)_6]$* , Angew. Chem. **118**, 8224–8228 (2006); Angew. Chemie. Int. Ed. **45**, 8055 (2006)
- [C1.1:3] O. Fuhr, L. Fernandez-Recio, and D. Fenske, *A simple synthetic route to the formation of tetracopper(I) 2-mercaptopthiazoline compounds – The crystal structures of  $[Cu_4(S-thiaz)_4(PEt_2Ph)_2]$ ,  $[Cu_4(S-thiaz)_4PEt_3)_2$ ,  $[Cu_4(S-thiaz)_4]_4$ , and  $[Cu_4(S-thiaz)_4]_4$* , Can. J. Chem. **84**, 251 (2006)
- [C1.1:4] \* R. Ahlrichs, N.R.M. Crawford, A. Eichhöfer, D. Fenske, O. Hampe, M. Kappes, and J. Olkowska-Oetzel, *Synthesis and Structure of Two Ionic Copper Indium Selenolate Cluster Complexes  $[As(C_6H_5)_4]_2[Cu_6In_4(SeC_6H_5)_{16}Cl_4]$  and  $[As(C_6H_5)_4][Cu_7In_4(SeC_6H_5)_{20}]$* , Eur. J. Inorg. Chem. 345 (2006)
- [C1.1:5] \* R. Ahlrichs, D. Fenske, A. Rothenberger, C. Schrotte, and S. Wieber, *Atom Assignment in Solid-State Structures on the Basis of X-ray Crystallography and DFT Calculations – A Case Study on a Molecular Cu-Sb Alloy*, Eur. J. Inorg. Chem. 1127 (2006)
- [C1.1:6] ‡ Q.-F. Zhang, Z. Yu, J. Ding, Y. Song, A. Rothenberger, D. Fenske, and W.-H. Leung, *Construction of New Heteroselenometallic Clusters: Formation of Crownlike  $[Et_4N]_4(\mu_5-WSe_4)(CuI)_5(\mu-I)_2$  and Octahedral Polymeric  $[(\mu_6-WSe_4)Cu_5I_4(py)_4]_n$  from Planar  $[Et_4N]_4[(\mu_4-WSe_4)Cu_4I_6]$  with Additional Faces*, Inorg. Chem. **45**, 5187 (2006)
- [C1.1:7] ‡ D.A. Bashirov, O. Fuhr, and S.N. Konchenko, *Synthesis and Structure of new Heteronuclear Clusters  $[PPh_4][Fe_4Rh_3Se_2(CO)_{16}]$  and  $[PPh_4]_2[Fe_3Rh_4Te_2(CO)_{15}]$* , Russ. Chem. Bull., Int. Ed. **55**, 802 (2006)
- [C1.1:8] P. Sevillano, O. Fuhr, E. Matern, and D. Fenske, *Synthese, Kristallstruktur und spektroskopische Charakterisierung von  $[Au_{12}(PPh)_2(P_2Ph_2)_2(dppm)_4Cl_2]Cl_2$* , Z. Anorg. Allg. Chem. **632**, 735 (2006)
- [C1.1:9] M. Shafaei-Fallah, W. Shi, D. Fenske, and A. Rothenberger, *Synthesen und Kristallstrukturen von Übergangsmetallkomplexen mit Dithiophosphinato- und Trithiophosphonator-Liganden*, Z. Anorg. Allg. Chem. **632**, 1091 (2006)
- [C1.1:10] \* R. Ahlrichs, A. Eichhöfer, D. Fenske, K. May, and H. Sommer, *Molekülstruktur und theoretische Untersuchungen von  $(PPh_4)_2[Bi_{10}Cu_{10}(SPh)_{24}]$* , Angew. Chem. **119**, 8402 (2007); Angew. Chem. Int. Ed. **46**, 8254 (2007)
- [C1.1:11] D. Fenske, A. Rothenberger, and S. Wieber, *Synthesis and Characterization of the First Silver Complexes with Antimony Anions*, Eur. J. Inorg. Chem. 648 (2007)

- [C1.1:12] ‡ A. Eichhofer, P.T Wood, R. Viswanath, and R.A. Mole, *Synthesis, structure and magnetic behaviour of Manganese(II) selenolate complexes*  $[\text{Mn}(\text{SePh})_2]$ ,  $[\text{Mn}(\text{SePh})_2(\text{bipy})_2]$  and  $[\text{Mn}(\text{SePh})_2(\text{phen})_2]$  (*bipy* = bipyridyl, *phen* = phenanthroline), *Eur. J. Inorg. Chem.* 4794 (2007)
- [C1.1:13] \* P. Sevillano, O. Fuhr, O. Hampe, S. Lebedkin, C. Neiss, R. Ahlrichs, D. Fenske, and M.M. Kappes, *Synthesis, characterization and quantum mechanical calculations of*  $[\text{Au}_{18}\text{Se}_8(\text{dppthph})_6]\text{Cl}_2$ , *Eur. J. Inorg. Chem.* 5163 (2007)
- [C1.1:14] \* P. Sevillano, O. Fuhr, O. Hampe, S. Lebedkin, E. Matern, D. Fenske, and M.M. Kappes, *Synthesis, Characterization and X-Ray Structure Determination of*  $[\text{Au}_{18}(\text{P})_2(\text{PPh})_4(\text{PHPh})(\text{dppm})_6]\text{Cl}_3$ , *Inorg. Chem.* **46**, 7294 (2007)
- [C1.1:15] D. Fenske, I. Issac, and A. Rothenberger, *Towards Syntheses and Structures of Heterometallic Clusters Containing Tantalum-tetrachalcogenato Building Blocks*, *J. Cluster Science* **18**, 19 (2007)
- [C1.1:16] ‡ C. Nitschke, A.I. Wallbank, D. Fenske, and J.F. Corrigan, *Facile Synthesis of High Nuclearity Silver-Ferrocenyldiselenolate Clusters*, *J. Cluster Science* **18**, 131 (2007)
- [C1.1:17] ‡ D. Cave, J.F. Corrigan, A. Eichhöfer, D. Fenske, C.M. Kowalchuk, H. Rösner and P. Scheer, *Investigation of the Thermal Properties of a Series of Copper Selenide Cluster Molecules*, *J. Cluster Science* **18**, 157 (2007)
- [C1.1:18] ‡ O. Fuhr, L. Fernandez-Rezio, A. Castiñeras, and D. Fenske, *Synthese und Struktur der Cluster*  $[\text{Cu}_{50}\text{Se}_{24}(\text{S-thiaz})_2(\text{dppm})_{10}]$  und  $[\text{Cu}_{48}\text{Se}_{24})\text{S-thiazH}]_2(\text{dppm})_{10}$ , *Z. Anorg. Allg. Chem.* **633**, 700 (2007)
- [C1.1:19] \* S. König, A. Eichhöfer, N. Crawford, R. Ahlrichs, and D. Fenske, *Synthese, Kristallstruktur und quantenchemische Untersuchung des phosphanstabilisierten Nickel-Schwefel-Clusters*  $[\text{Ni}_{32}\text{S}_{24}(\text{PPh}_3)_{10}]$ , *Z. Anorg. Allg. Chem.* **633**, 713 (2007)
- [C1.1:20] P. Sevillano, O. Fuhr, and D. Fenske, *Synthese und Struktur von*  $[\text{Au}_{10}\text{Se}_5(\text{dppa})_4\{\text{Co}_2(\text{CO})_5\}_4]$ , *Z. Anorg. Allg. Chem.* **633**, 1783 (2007)
- [C1.1:21] B. Bechlars, R. Feuerhake, and D. Fenske, *Synthesen und Kristallstrukturen neuer chalcogenido-verbrückter Niob-Kupfer-Cluster*, *Z. Anorg. Allg. Chem.* **633**, 2603 (2007)
- [C1.1:22] \* C. Anson, A. Eichhöfer, I. Issac, D. Fenske, O. Fuhr, P. Sevillano, C. Persau, D. Stalke, and J. Zhang, *Synthesis and crystal structures of the ligand-stabilized silver chalcogenide clusters*  $[\text{Ag}_{154}\text{Se}_{77}(\text{dppxy})_{18}]$ ,  $[\text{Ag}_{320}(\text{StBu})_{60}\text{S}_{130}(\text{dppp})_{12}]$ ,  $[\text{Ag}_{352}\text{S}_{128}(\text{StC}_5\text{H}_{11})_{96}]$ , and  $[\text{Ag}_{490}\text{S}_{188}(\text{StC}_5\text{H}_{11})_{114}]$ , *Angew. Chem.* **120**, 1346 (2008); *Angew. Chem. Int. Ed.* **47**, 1326 (2008)
- [C1.1:23] ‡ A. Eichhöfer, P.T. Wood, R.N. Viswanath, and R.A. Mole, *Synthesis, structure and physical properties of the manganese(II) selenide/selenolate cluster complexes*  $[\text{Mn}_{32}\text{Se}_{14}(\text{SePh})_{36}(\text{PnPr}_3)_4]$  and  $[\text{Na}(\text{benzene-15-crown-5})(\text{C}_4\text{H}_8\text{O})_2]_2[\text{Mn}_8\text{Se}(\text{SePh})_{16}]$ , *Chem. Commun.* 1596 (2008)
- [C1.1:24] ‡ B. Bechlars, I. Issac, R. Feuerhake, R. Clérac, O. Fuhr, and D. Fenske, *Syntheses, Structures and Magnetic Properties of New Chalcogen-Bridged Heterodimetallic Clusters Compounds with Heterocubane Structure*, *Eur. J. Inorg. Chem.* 1632 (2008)
- [C1.1:25] C.T. Mitkina, N. Zakharchuk, D. Naumov, O. Gerasko, D. Fenske, and V. Fedin, *Syntheses, Structures, and Electrochemical Properties of Inclusion Compounds of Cucurbit[8]uril with Cobalt(III) and Nickel(II) Complexes*, *Inorg. Chem.* **47**, 6748 (2008)

- [C1.1:26] H. Sommer, A. Eichhöfer, and D. Fenske, *Synthese und Kristallstrukturen der Bismutchalkogenolate  $Bi(SC_6H_5)_3$ ,  $Bi(SeC_6H_5)_3$  und  $Bi(S-4-CH_3C_6H_4)_3$* , Z. Anorg. Allg. Chem. **634**, 436 (2008)
- [C1.1:27] \*‡ O.A. Gerasko, E.A. Maichineva, M.I. Naumova, M. Neumaier, M.M. Kappes, S. Lebedkin, D. Fenske, and V.P. Fedin, *Sandwich-Type Tetranuclear Lanthanide Complexes with Cucurbit[6]uril: From Molecular Compounds to Coordination Polymers*, Inorg. Chem. **47**, 8869 (2008)
- [C1.1:28] \* H. Sommer, A. Eichhöfer, N. Drebov, R. Ahlrichs, and D. Fenske, *Preparation, Geometric and Electronic Structures of  $[Bi_2Cu_4(SPh)_8(PPh_3)_4]$  with a  $Bi_2$  Dumbbell,  $[Bi_4Ag_3(SePh)_6Cl_3(PPh_3)_3]_2$  and  $[Bi_4Ag_3(SePh)_6X_3(PPhiPr_2)_3]_2$  ( $X=Cl, Br$ ) with a  $Bi_4$  Unit*, Eur. J. Inorg. Chem. 5138 (2008)
- [C1.1:29] L. Fernandez-Recio, D. Fenske, and O. Fuhr, *Copper Chalcogenide Cluster Compounds with Nitro-functionalized Ligand Shell*, Z. Anorg. Allg. Chem. **634**, 2853 (2008)
- [C1.1:30] H. Sommer, A. Eichhöfer, and D. Fenske, *Synthese und Kristallstrukturen der Bismutchalkogenolate  $Bi(SC_6H_5)_3$ ,  $Bi(SeC_6H_5)_3$  und  $Bi(S-4-CH_3C_6H_4)_3$* , Z. Anorg. Allg. Chem. **634**, 436 (2008)
- [C1.1:31] ‡ N.V. Izarova, M.N. Sokolov, D.G. Samsonenko, A. Rothenberger, D. Fenske, and V.P. Fedin, *Synthesis and Structures of two new coordination polymers formed by large polyoxometalate fragments and lanthanide cations*, Russian Chemical Bulletin **57**, 78 (2008)
- [C1.1:32] \*‡ D. Coucouvanis, A.R. Patal, Q. Zhang, N. Lehnert, R. Ahlrichs, K. Fink, D. Fenske, A.K. Powell, and Y. Lan, *Synthesis Electronic Structure, and Structural Characterization of the New, Non - Innocent 4.5- Dithio - Catecholate Ligand, its Metal Complexes, and Their Oxidized 4, 5- Dithio-o-quinone Derivatives*, Inorg. Chem. **48**, 8830 (2009)
- [C1.1:33] \* A. Eichhöfer, J. Olkowska-Oetzel, D. Fenske, K. Fink, V. Mereacre, A.K. Powell, and G. Butth, *Synthesis and Structure of an “Iron-Doped” Copper Selenide Cluster Molecule:  $[Cu_{30}Fe_2Se_6(SePh)_{24}(dppm)_4]$* , Inorg. Chem. **48**, 8977 (2009)
- [C1.1:34] ‡ C.-F. Zhuang, J. Zhang, Q. Wang, Z.-H. Chu, D. Fenske, and C.-Y. Su, *Temperature-Dependent Guest-Driven Single-Crystal-to-Single-Crystal Ligand Exchange in a Two-Fold Interpenetrated  $Cd^{II}$  Grid Network*, Chem. Eur. J. **15**, 7578 (2009)
- [C1.1:35] ‡ J.F. Corrigan, O. Fuhr, and D. Fenske, *Metal Chalcogenide Clusters on the Border between Molecules and Materials*, Adv. Mater. **21**, 1867 (2009)
- [C1.1:36] R. Langer, L. Wünsche, D. Fenske, and O. Fuhr, *Kupferchalkogenid-Clusterverbindungen mit Brom-funktionalisierter Ligandenhülle*, Z. Anorg. Allg. Chem. **635**, 2488 (2009)
- [C1.1:37] S. König, D. Fenske, and F. Weigend, *Synthesis, Crystal Structure and Bond Situation of  $[Co_7Se_7Cp_3(CO)_4]$  Cp = Cyclopentadienyl*), Z. Anorg. Allg. Chem. **635**, 2288 (2009)
- [C1.1:38] H. Sommer, A. Eichhöfer, and D. Fenske, *Synthesis, Crystal Structure and Thermal Behavior of  $[BiAg_3Br_6(PPh_3)_6]$  and  $[Bi_3Ag_6(SPh)_6Cl_3(PPhiPr_2)_3]$* , Z. Anorg. Allg. Chem. **635**, 1997 (2009)
- [C1.1:39] \* H. Sommer, N. Drebov, A. Eichhöfer, R. Ahlrichs, and D. Fenske, *Synthesis, Structures and Theoretical Investigations of  $[Li(thf)_4]_2$   $[Ti_2Cu_8S_4(SPh)_{10}]$  and  $[Ti_2Ag_6S_6Cl_2(PPhiPr_2)_6]$* , Eur. J. Inorg. Chem. 4329 (2009)

- [C1.1:40] ‡ M.-L. Fu, D. Fenske, B. Weinert, and O. Fuhr, *One-Dimensional Coordination Polymers Containing Polynuclear (Selenolato) copper Complexes Linked By Bipyridine Ligands*, Eur. J. Inorg. Chem. 1098 (2010)
- [C1.1:41] G. Schmid and D. Fenske, *Metal Clusters and Nanoparticles*, Phil. Trans. R. Soc. A **368**, 1207 (2010)
- [C1.1:42] ‡ A. Eichhöfer, J.-J. Jiang, H. Sommer, F. Weigend, O. Fuhr, D. Fenske, C.-Y. Su, and G. Buth, *1-D-Tin(II) Phenylchalcogenolato Complexes  $^1\text{A}[\text{Sn}(E\text{Ph})_2]$  ( $E = \text{S}, \text{Se}, \text{Te}$ ) – Synthesis, Structures, Quantum Chemical Studies and Thermal Behaviour*, Eur. J. Inorg. Chem. 410 (2010)
- [C1.1:43] ‡ J.-J. Jiang, L. Li, M.-H. Lan, M. Pan, A. Eichhöfer, D. Fenske, and C.-Y. Su, *Thermally Stable Porous Hydrogen-Bonded Coordination Networks Displaying Dual Properties Of Robustness and Dynamics Upon Guest Uptake*, Chem. Eur. J. **16**, 1841 (2010)
- [C1.1:44] \* ‡ C.B. Khadka, D.G. Macdonald, Y. Lan, A.K. Powell, D. Fenske, and J.F. Corrigan, *Trimethylsilylchalcogenolates of Co(II) and Mn(II); From Mononuclear Coordination Complexes to Cluster Containing  $-\text{ESiMe}_3$  Moieties ( $E = \text{S}, \text{Se}$ )*, Inorg. Chem. **49**, 7289 (2010)
- [C1.1:45] ‡ M.L. Fu, I. Issac, D. Fenske, and O. Fuhr, *Metal-Rich Copper Chalcogenide Clusters at the Border Between Molecule and Bulk Phase: The Structures of  $[\text{Cu}_{93}\text{Se}_{42}(\text{SeC}_6\text{H}_4\text{SMe})_9(\text{PPh}_3)_{18}]$ ,  $[\text{Cu}_{96}\text{Se}_{45}(\text{SeC}_6\text{H}_4\text{SMe})_6(\text{PPh}_3)_{18}]$ , and  $[\text{Cu}_{136}\text{S}_{56}(\text{SCH}_2\text{C}_4\text{H}_3\text{O})_{24}(\text{dpppt})_{10}]$* , Angew. Chem. Int. Ed. **49**, 6899 (2010)
- [C1.1:46] ‡ S. Dehnen, A. Eichhöfer, J. F. Corrigan, O. Fuhr, and D. Fenske, *Synthesis and Characterization of I-VI Nanoclusters, in Nanoparticles; From Theory to Application*; Ed. By G. Schmid, page 127-213, Wiley-VCH, Weinheim 2010
- [C1.1:47] ‡ M.-L. Fu, D. Fenske, B. Weinert, and O. Fuhr, *One-Dimensional Coordination Polymers Containing Polynuclear (Selenolato)copper Complexes Linked by Bipyridine Ligands*, Eur. J. Inorg. Chem. 1098 (2010)
- [C1.1:48] R. Langer, B. Breiting, O. Fuhr, L. Wünsche, and D. Fenske, *Functionalized Silver Cluster*, Z. Anorg. Allg. Chem. **637**, 995 (2011)
- [C1.1:49] ‡ X. Wang, J. Huang, S. Xiang, Y. Liu, J. Zhang, A. Eichhöfer, D. Fenske, S. Bai and C.-Y. Su, *Discrete  $\text{Ag}_6\text{L}_6$  coordination nanotubular structures based on a T-shaped pyridyl diphosphine*, Chem. Commun. **47**, 3849 (2011)
- [C1.1:50] R. Langer, W. Yu, L. Wünsche, G. Buth, O. Fuhr, and D. Fenske, *Synthese und Strukturaufklärung Trimethylsiloxy-funktionalisierter Kupferchalkogenidcluster*, Z. Anorg. Allg. Chem. **637**, 1834 (2011)
- [C1.1:51] ‡ S. Ahmar, C. Nitschke, N. Vijayaratnam, D.G. MacDonald, D. Fenske, and J.F. Corrigan, *A ferrocenylmethylselenolate complex of Ag(I): preparation of the polyferrocenyl cluster  $[\text{Ag}_8(\text{SeCH}_2\text{Fc})_8(\text{PPh}_3)_4]$  from the new silylated reagent  $\text{FcCH}_2\text{SeSiMe}_3$* , New J. Chem. **35**, 2013 (2011)

#### C1.4 ‘Nanoscale Hollow Spheres’ (C. Feldmann)

- [C1.4:1] \* C. Zimmerman, C. Feldmann, M. Wanner, and D. Gerthsen, *Nanoscale Gold Hollow Spheres via Microemulsion Approach*, Small **3**, 1347 (2007)
- [C1.4:2] D.H.M. Buchold and C. Feldmann, *Nanoscale Al(OH) Hollow Spheres - Synthesis and Container-type Functionality*, Nano Lett. **7**, 3489 (2007)
- [C1.4:3] D.H.M. Buchold and C. Feldmann, *Microemulsion Approach to Non-agglomerated and Crystalline Nanomaterials*, Adv. Funct. Mater. **18**, 1002 (2008)
- [C1.4:4] D.H.M. Buchold and C. Feldmann, *Nanoscale Complex Metal Cyanides and Thermolysis thereof*, Solid State Sci. **10**, 1305 (2008)
- [C1.4:5] H. Gröger, F. Gyger, P. Leidinger, C. Zurmühl, and C. Feldmann, *Microemulsion Approach to Nanocontainers and its Variability in Composition and Filling*, Adv. Mater. **21**, 1586 (2009)
- [C1.4:6] H. Goesmann and C. Feldmann, *Nanoparticulate Functional Materials (Review)*, Angew. Chem. Int. Ed. **49**, 1362 (2010)
- [C1.4:7] F. Gyger, M. Hübner, C. Feldmann, N. Barsan, and U. Weimar, *Nanoscale SnO<sub>2</sub> Hollow Spheres and Their Application as a Gas-Sensing Material*, Chem. Mater. **22**, 4821 (2010)
- [C1.4:8] \* C. Kind, R. Popescu, E. Müller, D. Gerthsen, and C. Feldmann, *Microemulsion-based Synthesis of nanoscaled Silver Hollow Spheres and Direct Comparison to Massive Particles of Similar Size*, Nanoscale **2**, 2223 (2010)
- [C1.4:9] \* P. Leidinger, R. Popescu, D. Gerthsen, and C. Feldmann, *Nanoscale La(OH)<sub>3</sub> Hollow Spheres and Fine-tuning of Its Outer Diameter and Cavity Size*, Small **6**, 1886 (2010)
- [C1.4:10] H. Gröger, C. Kind, P. Leidinger, M. Roming, and C. Feldmann, *Nanoscale Hollow Spheres: Microemulsion-based Synthesis, Structural Characterization and Container-type Functionalities (Review)*, Materials **3**, 4355 (2010)
- [C1.4:11] \* C. Zurmühl, R. Popescu, D. Gerthsen, and C. Feldmann, *Microemulsion-based Synthesis of Nanoscale TiO<sub>2</sub> Hollow Spheres*, Solid State Sci. **13**, 1505 (2011)
- [C1.4:12] \* P. Leidinger, R. Popescu, D. Gerthsen, and C. Feldmann, *Nanoscale Copper Sulfide Hollow Spheres with precisely adjusted Phase Composition: Covellite (CuS), Digenite (Cu<sub>1.8</sub>S), Chalcocite (Cu<sub>2</sub>S)*, Nanoscale **3**, 2544 (2011)
- [C1.4:13] \* S. Indris, M. Scheuermann, S. Becker, V. Šepelák, R. Kruk, J. Suffner, F. Gyger, C. Feldmann, A.S. Ulrich, and H. Hahn, *Local Structural Disorder and Relaxation in SnO<sub>2</sub> Nanostructures Studied by <sup>119</sup>Sn MAS NMR and <sup>119</sup>Sn Mössbauer Spectroscopy*, J. Phys. Chem. C **115**, 6433 (2011)
- [C1.4:14] \* S. Simonato, H. Gröger, J. Möllmer, R. Staudt, A. Puls, F. Dreisbach, and C. Feldmann, *Reversible Sorption and Storage of CO<sub>2</sub> with Nanoscale γ-Al(OH) Hollow Spheres*, Chem. Commun. **48**, 844 (2012)

## C1.5 ,Oxo / Hyroxo Clusters of the Lanthanides for Potential Photonic and Magnetic Applications' (P. Roesky)

- [C1.5:1] \* ‡ M.T. Gamer, P.W. Roesky, S.N. Konchenko, P. Nava, and R. Ahlrichs, *Report on an Al-Eu and an Al-Yb Donor-Acceptor Bond*, Angew. Chem. **118**, 4558 (2006); Angew. Chem. Int. Ed. **45**, 4447 (2006)
- [C1.5:2] \* ‡ M. Wiecko, P.W. Roesky, P. Nava, R. Ahlrichs, and S.N. Konchenko, *Gallium(I)-Alkaline Earth Metal Donor-Acceptor bonds*, Chem. Commun. 927 (2007)
- [C1.5:3] \* ‡ M.T. Gamer, Y. Lan, P.W. Roesky, A.K. Powell, and R. Clérac, *A Pentanuclear Dysprosium Hydroxy Cluster Showing Single Molecule Magnet Behavior*, Inorg. Chem. **47**, 6581 (2008)
- [C1.5:4] \* ‡ A. Bhunia, P.W. Roesky, Y. Lan, G.E. Kostakis, and A.K. Powell, *Salen-Based Infinite Coordination Polymers of Nickel and Copper*, Inorg. Chem. **48**, 10483 (2009)
- [C1.5:5] ‡ D.T. Thielemann, I. Fernández, and P.W. Roesky, *New Amino Acid Ligated Yttrium Hydroxy Clusters*, Dalton Trans. **39**, 6661 (2010)
- [C1.5:6] B. Murugesapandian and P.W. Roesky, *Sodium and Potassium Compounds of  $[(\eta^6\text{-benzenecarboxylate})\text{Cr}(\text{CO})_3]$  and  $[(\eta^6\text{-1,4-benzenedicarboxylate})\text{Cr}(\text{CO})_3]$* , Dalton Trans. **39**, 9598 (2010)
- [C1.5:7] C.P. Hauser, D.T. Thielemann, M. Adlung, C. Wickleder, P.W. Roesky, C.K. Weiss, and K. Landfester, *Luminescent polymeric dispersions and films based on oligonuclear lanthanide clusters*, Macromol. Chem. Phys. **212**, 286 (2011)
- [C1.5:8] B. Murugesapandian and P.W. Roesky, *Hydrogen bonding networks in  $[\eta^6\text{-arene})\text{Cr}(\text{CO})_3]$  complexes*, Heteroatom Chem. **22**, 294 (2011)
- [C1.5:9] B. Murugesapandian and P.W. Roesky, *Coordination Polymers of Zinc with  $(\eta^6\text{-Benzene carboxylate})\text{Cr}_3(\text{CO})_6$* , Inorg. Chem. **50**, 1698 (2011)
- [C1.5:10] \* P.W. Roesky, A. Bhunia, Y. Lan, A.K. Powell, and S. Kureti, *Salen-Based Metal Organic Frameworks of Nickel and the Lanthanides*, Chem. Commun. **47**, 2035 (2011)
- [C1.5:11] B. Murugesapandian and P.W. Roesky, *Synthesis and Structures of Cadmium(II) Complexes with  $(\eta^6\text{-Benzene carboxylate})\text{Cr}_3(\text{CO})_6$* , Eur. J. Inorg. Chem. 4103 (2011)
- [C1.5:12] \* A. Bhunia, Y. Lan, V. Mereacre, M.T. Gamer, A.K. Powell, and P.W. Roesky, *Salen-Based Coordination Polymers of Iron and the Rare Earth Elements*, Inorg. Chem. **50**, 12697 (2011)
- [C1.5:13] \* D.T. Thielemann, M. Klinger, T. Wolf, Y. Lan, W. Wernsdorfer, M. Busse, P.W. Roesky, A.N. Unterreiner, A.K. Powell, P.C. Junk, and G.B. Deacon, *Novel Lanthanide Based Polymeric Chains and Corresponding Ultrafast Dynamics in Solution*, Inorg. Chem. **50**, 11990 (2011)
- [C1.5:14] B. Murugesapandian and P.W. Roesky, *Synthesis and Structure of Lead(II) Complexes of  $(\eta^6\text{-Benzene carboxylato})\text{Cr}_3(\text{CO})_6$* , Eur. J. Inorg. Chem., DOI: 10.1002/ejic.201100948 (2011)

**C1.6 ‘Generation and Applications of New Nano-Structured Materials: Novel Chiral Lanthanides-C<sub>60</sub> Buckminster Fullerene Clusters’ (S. Bräse, P. Roesky)**

- [C1.6:1] P. Pierrat, C. Réthoré, T. Muller, and S. Bräse, *Design and Efficient Synthesis of Fullerene Bismalonates as Building Blocks for Metal Organic Frameworks*, *Synlett.* 1706 (2008)
- [C1.6:2] P. Pierrat, S. Vanderheiden, T. Muller, and S. Bräse, *Functionalization of Hexakis Methanofullerene Malonate Crown-Ethers: Promising Octahedral Building Blocks for Molecular Networks*, *Chem. Commun.* 1748 (2009)
- [C1.6:3] P. Pierrat, C. Réthoré, T. Muller, and S. Bräse, *Di- and Dodeca-Mitsunobu Reactions on C<sub>60</sub> Derivatives: Post-Functionalization of Fullerene Mono- and Hexakis-Adducts*, *Chem. Eur. J.* **15**, 11458 (2009)
- [C1.6:4] \* S.N. Konchenko, N.A. Pushkarevsky, M.T. Gamer, R. Koppe, H. Schnöckel, and P.W. Roesky, *[{( $\eta^5$ -C<sub>5</sub>Me<sub>5</sub>)<sub>2</sub>Sm}]<sub>4</sub>P<sub>8</sub>*: A Molecular Polyphosphide of the Rare Earth Elements, *J. Am. Chem. Soc.* **131**, 5740 (2009)
- [C1.6:5] \* A.J. Inglis, P. Pierrat, T. Muller, S. Bräse, and C. Barner-Kowollik, *Well-Defined Star Shaped Polymer-Fullerene Hybrids via Click Chemistry*, *Soft Matter* **6**, 82 (2010)