

## Dr. Peng Yang

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## Education

- **Ph.D. (10/2012 – 05/2016) Inorganic Chemistry (advisor: Prof. Ulrich Kortz)**  
*Department of Life Sciences and Chemistry, Jacobs University, Germany*
  - **Design and Development of Noble Metal-Based Polyoxometalates (POMs):**
    - ✓ Exploration of noble metal (e.g., Pd, Pt, Au, and Ag) based POMs on solid-state structural determination, liquid & gas-phase behaviors, and novel synthetic methodologies.
    - ✓ Chemical separation by using host-guest interactions of palladate nanocages with main group elements, lanthanides, and actinides.
    - ✓ Post-modification of polyoxopalladates as tunable surfactants.
    - ✓ Pioneer composite noble-metalates as industrial catalysts.
  - **Structure–Biological Activity Relationships of Organometallic–POM Hybrids:**  
Controlled design and synthesis of novel organoantimony(III) complexes and their combined POM hybrids with a special focus on the structure–antibacterial activity relationships.
- **M.Sc. (09/2009 – 07/2012) Inorganic Chemistry (advisor: Prof. Ming-Xing Li)**  
*Department of Chemistry, College of Science, Shanghai University, P. R. China*
  - **Syntheses, Structures, Electric and Magnetic Properties of Homochiral Metal–Organic Frameworks (MOFs) and Coordination Polymers (CPs):**  
Self-assembly of homochiral MOFs and CPs directed by introduction of intrinsic enantiopure organic ligands or spatial arrangement of achiral building blocks, along with the investigation of their potential applications in piezoelectrics, ferroelectrics, nonlinear optics, magnetism and so forth.
- **B.Eng. (09/2005 – 07/2009) Pharmaceutical Engineering**  
*Department of Pharmaceutical Engineering, College of Biotechnology and Food Science, Tianjin University of Commerce, P. R. China*

## Expertise

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- **Synthetic Skills on POMs, MOFs, CPs, and Organometallic Compounds:** aqueous solution synthesis, hydro/solvo-thermal approach, microwave, schlenk line and etc.
- **Characterization Techniques:** single-crystal XRD, multinuclear NMR (e.g.,  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{17}\text{O}$ ,  $^{31}\text{P}$ ,  $^{51}\text{V}$ ,  $^{71}\text{Ga}$ ,  $^{77}\text{Se}$ ,  $^{115}\text{In}$ ,  $^{183}\text{W}$ , and  $^{205}\text{Tl}$ ), powder XRD, FT-IR spect., UV-Vis spect., fluorescence spect., circular dichroism spect., atomic absorption spect., TGA and etc.
- **Application Softwares:** Shelxtl, Platon, Diamond, Mercury, MestReNova, OriginPro, ChemDraw, Bond Valence-Sum (BVS) Calculations and etc.

## Publications

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1. Discrete Ag(I)-Pd(II)-Oxo Nanoclusters,  $\{\text{Ag}_4\text{Pd}_{13}\}$  and  $\{\text{Ag}_5\text{Pd}_{15}\}$ , and the Role of Metal–Metal Bonding Induced by Cation Confinement  
[P. Yang](#), Y. Xiang, Z. Lin, Z. Lang, P. Jiménez-Lozano, J. J. Carbó, J. M. Poblet, L. Fan, C. Hu, U. Kortz, *Angew. Chem., Int. Ed.* in press.
2. Tetra-Antimony(III)-Bridged 18-Tungsto-2-Arsenates(V),  $[(\text{LSb}^{\text{III}})_4(\text{A-}\alpha\text{-As}^{\text{V}}\text{W}_9\text{O}_{34})_2]^{10-}$  (L = Ph, OH): Turning Bioactivity On and Off by Ligand Substitution  
[P. Yang](#), Z. Lin, B. S. Bassil, G. Alfaro-Espinoza, M. S. Ullrich, M.-X. Li, C. Silvestru, U. Kortz, *Inorg. Chem.* 55, 3718–3720 (2016).
3. 19-Tungstodiarсенate(III) Functionalized by Organoantimony(III) Groups: Tuning the Structure–Bioactivity Relationship  
[P. Yang](#), Z. Lin, G. Alfaro-Espinoza, M. S. Ullrich, C. Rat, C. Silvestru, U. Kortz, *Inorg. Chem.* 55, 251–258 (2016).
4. Organoantimony(III)-Containing Tungstoarsenates(III): From Controlled Assembly to Biological Activity  
[P. Yang](#), B. S. Bassil, Z. Lin, A. Haider, G. Alfaro-Espinoza, M. S. Ullrich, C. Silvestru, U. Kortz, *Chem. Eur. J.* 21, 15600–15606 (2015).
5. Alkaline Earth Guests in Polyoxopalladate Chemistry: From Nanocube to Nanostar via an Open-Shell Structure  
[P. Yang](#), Y. Xiang, Z. Lin, B. S. Bassil, J. Cao, L. Fan, Y. Fan, M.-X. Li, P. Jiménez-Lozano, J. J. Carbó, J. M. Poblet, U. Kortz, *Angew. Chem., Int. Ed.* 53, 11974–11978 (2014).
6. Seven Novel Coordination Polymers Constructed by Rigid 4-(4-carboxyphenyl)-terpyridine Ligands: Synthesis, Structural Diversity, Luminescence and Magnetic Properties  
[P. Yang](#), M.-S. Wang, J.-J. Shen, M.-X. Li, Z.-X. Wang, M. Shao, X. He, *Dalton Trans.* 43, 1460–1470 (2014).
7. Porous and Nanorod-Like Coordination Polymers Assembled from a New V-Shaped Bis(1,2,4-triazolyl)terpyridine Ligand  
[P. Yang](#), M.-X. Li, M. Shao, M.-S. Wang, S.-X. Cao, J.-C. Zhang, H.-H. Zhang, *Cryst. Growth Des.* 13, 4305–4314 (2013).

8. The First Homochiral Coordination Polymer with Temperature-Independent Piezoelectric and Dielectric Properties  
[P. Yang](#), X. He, M.-X. Li, Q. Ye, J.-Z. Ge, Z.-X. Wang, S.-R. Zhu, M. Shao, H.-L. Cai, *J. Mater. Chem.* **22**, 2398–2400 (2012).
9. A Novel Layered Supramolecular Compound Containing 2D Network of Eight-Member Water Clusters and Terephthalate Extended-Bridged  
[P. Yang](#), X. Chen, S. Ren, S.-L. Ma, *Struct. Chem.* **19**, 291–295 (2008).
10. The Polyoxo-22-palladate(II),  $[\text{Na}_2\text{Pd}^{\text{II}}_{22}\text{O}_{12}(\text{As}^{\text{V}}\text{O}_4)_{15}(\text{As}^{\text{V}}\text{O}_3\text{OH})]^{25-}$   
N. V. Izarova, Z. Lin, [P. Yang](#), A. Kondinski, N. Vankova, T. Heine, U. Kortz, *Dalton Trans.* **45**, 2394–2398 (2016).
11. Molecular Spin Qubits Based on Lanthanide Ions Encapsulated in Cubic Polyoxopalladates: Design Criteria to Enhance Quantum Coherence  
J. J. Baldoví, L. E. Rosaleny, V. Ramachandran, J. Christian, N. S. Dalal, J. M. Clemente-Juan, [P. Yang](#), U. Kortz, A. Gaita-Ariño, E. Coronado, *Inorg. Chem. Front.* **2**, 893–897 (2015).
12. Exploring the Effect of Surface Functionality on the Self-Assembly of Polyoxopalladate Macroions  
F. Haso, [P. Yang](#), Y. Gao, P. Yin, H. Li, T. Li, U. Kortz, T. Liu, *Chem. Eur. J.* **21**, 9048–9052 (2015).
13. Chiral Coordination Polymers with SHG-Active and Luminescence: An Unusual Homochiral 3D MOF Constructed from Achiral Components  
N. Chen, M.-X. Li, [P. Yang](#), X. He, M. Shao, S.-R. Zhu, *Cryst. Growth Des.* **13**, 2650–2660 (2013).
14. Synthesis, Structure, Luminescence and Magnetic Property of Camphorate Coordination Polymers Containing 5,6-dimethylbenzimidazole Auxiliary Ligand  
N. Chen, [P. Yang](#), X. He, M. Shao, M.-X. Li, *Inorg. Chim. Acta* **405**, 43–50 (2013).
15. Two New Cyanide-Bridged Complexes,  $\{[\text{Cu}(\text{men})_2][\text{Ni}(\text{CN})_4]\}_n$  and  $[\text{Mn}(\text{bpy})_2]_4[\text{Mo}(\text{CN})_8]_2 \cdot 0.5\text{MeOH} \cdot 0.75\text{H}_2\text{O}$ : Synthesis and Crystal Structures  
X. Chen, [P. Yang](#), S.-L. Ma, S. Ren, M.-Y. Tang, Y.-Yang, Z.-J. Guo, L.-Z. Liu, *J. Struct. Chem.* **50**, 495–499 (2009).

## Scientific Training

- **Collaboratively Write Proposals for Research Funding.** (e.g., **ERC** (European Research Council) Advanced Grant, **DFG** (Deutsche Forschungsgemeinschaft), **DAAD** (Deutscher Akademischer Austausch Dienst), **NSFC** (Natural Science Foundation of China))
- **Synthesis of Organoantimony(III) Complexes Using Schlenk Line.** (Supervisor: Prof. Cristian Silvestru) May 5<sup>th</sup> – 30<sup>th</sup>, 2015. Babes-Bolyai University, Cluj-Napoca, Romania
- **<sup>17</sup>O NMR Spectroscopic Study of Polyoxopalladates.** (Supervisor: Prof. Imre Tóth) September 1<sup>st</sup> – 14<sup>th</sup>, 2014. Debrecen University, Debrecen, Hungary

## Tutoring Experience

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### Teaching Assistant (10/2013 – now)

*Department of Life Sciences and Chemistry, Jacobs University, Germany*

- Experiments on General Chemistry (e.g., safety instruction and experimental guidance).
- Supervise undergraduates on carrying out research.

## Selected Awards

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- **Special Distinction of Doctoral Dissertation of Germany** (06/2016)
- **National Government Scholarship of P. R. China** (10/2012 – 10/2016)
- **Outstanding Postgraduate Student of Shanghai University** (07/2012)
- **Nian-Yi Chen Fellowship of Shanghai University** (07/2012)
- **Winner of Innovation Funds for Postgraduate Students of Shanghai University** (09/2010)
- **National Second Prize in the 11<sup>th</sup> “Challenge Cup” Undergraduate Curricular Academic Science and Technology Works by Race of P. R. China** (11/2009)
- **Third Prize in the Chem. Experiment Competition for Undergraduates of Tianjin** (05/2007)
- **First-Class Fellowship of Tianjin University of Commerce** (09/2005 – 07/2007)

## Conferences

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### Oral Contributions

- **Peng Yang**, Gabriela Alfaro-Espinoza, Matthias S. Ullrich, Cristian Silvestru, Ulrich Körtz. *Organoantimony(III)-Functionalized Heteropolytungstates: From Structure to Biological Activity*. The 8<sup>th</sup> European School on Molecular Nanoscience, October 25<sup>th</sup> – 29<sup>th</sup>, **2015**. Paris, France
- **Peng Yang**, Gabriela Alfaro-Espinoza, Matthias S. Ullrich, Cristian Silvestru, Ulrich Körtz. *Organoantimony(III)-Functionalized Heteropolytungstates: From Controlled Assembly to Biological Activity*. Norddeutsches Doktorandenkolloquium, September 7<sup>th</sup> – 8<sup>th</sup>, **2015**. Goettingen, Germany
- **Peng Yang**, Yixian Xiang, Zhengguo Lin, Ulrich Körtz. *Alkaline Earth Guests in Polyoxopalladate Chemistry: From Nanocube to Nanostar via an Open-Shell Structure*. Chemisches Doktorandenkolloquium GDCh-Ortsverband Bremen WiSe, December 15<sup>th</sup>, **2014**. Bremen, Germany
- **Peng Yang**, Yixian Xiang, Zhengguo Lin, Ulrich Körtz. *Lacunary Open-Shell-Type Polyoxopalladates*. International Symposium “Frontiers in Metal-Oxide Cluster Science” and European Conference “Polyoxometalate Chemistry for Molecular Nanoscience”, July 12<sup>th</sup> – 15<sup>th</sup>, **2014**. Maffliers, France

## Poster Contributions

- **Peng Yang**, Gabriela Alfaro-Espinoza, Matthias S. Ullrich, Cristian Silvestru, Ulrich Kortz. *Organoantimony(III)-Functionalized Heteropolytungstates: From Controlled Assembly to Biological Activity*. GDCh-Wissenschaftsforum Chemie, August 30<sup>th</sup> – September 2<sup>nd</sup>, **2015**. Dresden, Germany
- **Peng Yang**, Bassem S. Bassil, Isabella Römer, Ulrich Kortz. *Cyclic Tungstogermanate(IV) Stabilizing a Cerium(IV)-Peroxo Core*. The 4<sup>th</sup> Joint Meeting of COST Action CM1006: European f-Element Chemistry, April 9<sup>th</sup> – 12<sup>th</sup>, **2015**. Lisbon, Portugal
- Yixian Xiang, **Peng Yang**, Bassem S. Bassil, Ulrich Kortz. *Transition Metal-Containing Polyoxopalladates*. Norddeutsches Doktorandenkolloquium, September 11<sup>th</sup> – 12<sup>th</sup>, **2013**. Bremen, Germany

## Seminars

- 65<sup>th</sup> Lindau Nobel Laureate Meeting, June 28<sup>th</sup> – July 3<sup>rd</sup>, **2015**. Lindau, Germany
- Solar Fuels Summer School, October 6<sup>th</sup> – 9<sup>th</sup>, **2013**. Ellwangen, Germany

## Internship

### Assistant Chemist (02/2012 – 07/2012)

Department of Chemicals, Specialty Materials & Fertilizers, Honeywell International Inc. (US)

- Competitor analysis (e.g., SEM, EDS, XRF) on break pads for automobile.

## Languages

- **English**      Fluent
- **German**     Beginner
- **Chinese**    Native