

Dmitry V. Peryshkov

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Education and Work Experience:

- 2013-present Assistant Professor, Department of Chemistry and Biochemistry,
University of South Carolina
- 2011–2013 Postdoctoral Research Associate, Department of Chemistry
Massachusetts Institute of Technology (Advisor: Professor R.R. Schrock)
- 2006–2011 Ph.D. in Chemistry, Department of Chemistry
Colorado State University (Advisor: Professor S.H. Strauss)
- 1998–2004 B.S. and M.S. in Materials Science, Department of Materials Science
Moscow State University, Russia (Advisor: Professor E.A. Goodilin)

Research Interests

Inorganic Chemistry, Organometallic Chemistry, Catalysis, Solar Fuels, Small Molecule Activation.

Awards

Doctoral New Investigator Award, American Chemical Society Petroleum Research Fund, 2014

National Science Foundation Faculty Early Career Development Program (CAREER) Award, 2017

List of Publications:

44. Eleazer, B. J.; Smith, M. D.; Popov, A. A.*; **Peryshkov, D. V.*** Expansion of the (BB)>Ru Metallacycle with Coinage Metal Cations: Formation of B-M-Ru-B (M = Cu, Ag, Au) Dimetalacyclodiboryls *Chemical Science* **2018**, *9*, 2601–2608.

43. Islam, M. J.; Smith, M. D.; **Peryshkov, D. V.*** Sterically Encumbered Dianionic Dicarboranyl Pincer Ligand (C₅H₃N)(C₂B₁₀H₁₁)₂ and its CNC Nickel(II) Complex *Journal of Organometallic Chemistry* (Special Issue in celebration of Irina P. Beletskaya 85th Birthday) **2017** DOI: *j.jorganchem.2017.11.004*

42. Rahman, M. M.; Smith, M. D.; Amaya, J. A.; Makris, T. M.; **Peryshkov, D. V.*** Activation of C–H Bonds of Alkyl- and Arylnitriles by the TaCl₅–PPh₃ Lewis Pair *Inorganic Chemistry* **2017**, *56*, 11798–11803.

41. Eleazer, B. J.; Smith, M. D.; Popov, A. A.*; **Peryshkov, D. V.*** Rapid Reversible Borane to Boryl Hydride Exchange by Metal Shuttling on the Carborane Cluster Surface *Chemical Science* **2017**, *8*, 5399–5407.

40. **Peryshkov, D. V.***; Strauss, S. H.* Exceptional Structural Compliance of the B₁₂F₁₂²⁻ Superweak Anion *Inorganic Chemistry*, **2017**, *56*, 4072–4083.

39. Eleazer, B. J.; Smith, M. D.; **Peryshkov, D. V.*** POBOP Pincer Complexes of Nickel(II): Synthesis and B–H Activation of the Carborane Ligand Upon Oxidation with Iodine *Journal of Organometallic Chemistry* (Special Issue “Frontiers in Organometallic Chemistry 2016”) **2017**, *829*, 42–47.

38. Wong, Y. O.; Smith, M. D.; **Peryshkov, D. V.*** Reversible Water Activation Driven by Contraction and Expansion of the 12-vertex-*closo*-12-vertex-*nido* Biscarborane Cluster *Chemical Communications* **2016**, *52*, 12710–12713.

37. Eleazer, B. J.; Smith, M. D.; Popov, A. A.*; **Peryshkov, D. V.*** (BB)-Carboryne Complex of Ruthenium: Synthesis by Double B–H Activation at a Single Metal Center *Journal of the American Chemical Society* **2016**, *138*, 10531–10538.

36. Adams, R. D.*; Kiprotich, J.; **Peryshkov, D. V.***; Wong, Y. O. Opening of Carborane Cages by Metal Cluster Complexes. The Reaction of a Thiolate-Substituted Carborane with Triosmium Carbonyl Cluster Complexes *Inorganic Chemistry* **2016**, *55*, 8207–8213.

35. Rahman, M. M.; Smith, M. D.; **Peryshkov, D. V.*** Formation of a Cationic Vinylimido Group upon C–H Activation of Nitriles by Trialkylamines in the Presence of TaCl₅ *Inorganic Chemistry* **2016**, *55*, 5101–5103.

34. Wong, Y. O.; Smith, M. D.; **Peryshkov, D. V.*** Synthesis of the first example of the 12-vertex-*closo*-12-vertex-*nido* biscarborane cluster by a metal-free B–H activation at a phosphorus(III) center *Chemistry – A European Journal* **2016**, *22*, 6764–6767.

33. Adams, R. D.*; Kiprotich, J.; **Peryshkov, D. V.***; Wong, Y. O. Cage Opening of a Carborane Ligand by Metal Cluster Complexes *Chemistry – A European Journal* **2016**, *22*, 6501–6504.

32. Eleazer, B. J.; Smith, M. D.; **Peryshkov, D. V.*** Metal- and Ligand-Centered Reactivity of *meta*-Carboranyl-Backbone Pincer Complexes of Rhodium *Organometallics*, **2016**, *35*, 106–112.

31. Bukovsky, E. V.; **Peryshkov, D. V.**; Wu, H.; Zhou, W.; Tang, W. S.; Jones, W. M.; Stavila, V.; Udovic, T. J.; Strauss, S. H. Comparison of the Coordination of B₁₂F₁₂²⁻, B₁₂Cl₁₂²⁻, and B₁₂H₁₂²⁻ to Na⁺ in the Solid State: Crystal Structures and Thermal Behavior of Na₂(B₁₂F₁₂), Na₂(H₂O)₄(B₁₂F₁₂), Na₂(B₁₂Cl₁₂), and Na₂(H₂O)₆(B₁₂Cl₁₂) *Inorganic Chemistry* **2017** *56*, 4369–4379.

30. Malischewski, M.; **Peryshkov, D. V.**; Bukovsky, E. V.; Seppelt, K.; Strauss, S. H. Structures of M₂(SO₂)₆B₁₂F₁₂ (M = Ag or K) and Ag₂(H₂O)₄B₁₂F₁₂: Comparison of the Coordination of SO₂ versus H₂O and of B₁₂F₁₂²⁻ versus Other Weakly Coordinating Anions to Metal Ions in the Solid State *Inorganic Chemistry* **2016**, *55*, 12254–12262.

29. Conley, M. P.; Mougél, V.; **Peryshkov, D. V.**; Forrest, Jr. W. P.; Gajan, D.; Lesage, A.; Emsley, L.; Copéret, C.; Schrock, R. R. A Well-Defined Silica-Supported Tungsten Oxo Alkylidene Is a Highly Active Alkene Metathesis Catalyst *Journal of the American Chemical Society* **2013**, *135*, 19068–19070.

28. Cain, M. F.; Forrest, Jr. W. P.; **Peryshkov, D. V.**; Schrock, R. R.; Müller, P. Synthesis of a TREN in Which the Aryl Substituents are Part of a 45 Atom Macrocycle *Journal of the American Chemical Society* **2013**, *135*, 15338–15341.
27. **Peryshkov, D. V.**; Forrest, Jr. W. P.; Schrock, R. R.; Smith, S. J.; Müller, P. $B(C_6F_5)_3$ Activation of Oxo Tungsten Complexes That Are Relevant to Olefin Metathesis *Organometallics*, **2013**, *32*, 5256–5259.
26. Bukovsky, E. V.; Fiedler, S. R.; **Peryshkov, D. V.**; Popov, A. A.; Strauss, S. H. The Structure of $(H_3O)_2B_{12}F_{12} \cdot 6H_2O$ – a CCP Lattice of $B_{12}F_{12}^{2-}$ Anions Intercalated with a Nonplanar Network of O–H \cdots O Connected O_6 Rings. *European Journal of Inorganic Chemistry* **2012**, 208–212.
25. **Peryshkov, D. V.**, Schrock, R. R. Synthesis of Tungsten Oxo Alkylidene Complexes *Organometallics*, **2012**, *31*, 7278–7286
24. **Peryshkov, D. V.**; Schrock, R. R.; Takase, M. K.; Mueller, P.; Hoveyda, A. H. Z-Selective Olefin Metathesis Reactions Promoted by Tungsten Oxo Alkylidene Complexes. *Journal of the American Chemical Society* **2011**, *133*, 20754–20757.
23. Belletire, J. L.; Schneider, S.; Shackelford, S. A.; **Peryshkov, D. V.**; Strauss, S. H. Pairing heterocyclic cations with closo-dodecafluorododecaborate (2–). Synthesis of binary heterocyclium(1+) salts and a $Ag_4(\text{heterocycle})_8^{4+}$ salt of $B_{12}F_{12}^{2-}$. *Journal of Fluorine Chemistry* **2011**, *132*, 925–936.
22. Shackelford, S. A.; Belletire, J. L.; Boatz, J. A.; Schneider, S.; Wheaton, A. K.; Wight, B. A.; Ammon, H. L.; **Peryshkov, D. V.**; Strauss, S. H. Bridged Heterocyclium Dicationic closo-Icosahedral Perfluoroborane, Borane, and Carborane Salts via Aqueous, Open-Air Benchtop Synthesis (vol 12, pg 2714, 2010). *Organic Letters* **2011**, *13*, 2795–2796.
21. Shustova, N. B.; **Peryshkov, D. V.**; Kuvychko, I. V.; Chen, Y.-S.; Mackey, M. A.; Coumbe, C. E.; Heaps, D. T.; Confait, B. S.; Heine, T.; Phillips, J. P.; Stevenson, S.; Dunsch, L.; Popov, A. A.; Strauss, S. H.; Boltalina, O. V. Poly(perfluoroalkylation) of Metallic Nitride Fullerenes Reveals Addition-Pattern Guidelines: Synthesis and Characterization of a Family of $Sc_3N@C-80(CF_3)(n)$ ($n=2-16$) and Their Radical Anions. *Journal of the American Chemical Society* **2011**, *133*, 2672–2690.
20. Shustova, N. B.; Kuvychko, I. V.; **Peryshkov, D. V.**; Whitaker, J. B.; Larson, B. W.; Chen, Y.-S.; Dunsch, L.; Seppelt, K.; Popov, A. A.; Strauss, S. H.; Boltalina, O. V. Chemical tailoring of fullerene acceptors: synthesis, structures and electrochemical properties of perfluoroisopropylfullerenes. *Chemical Communications* **2011**, *47*, 875–877.
19. **Peryshkov, D. V.**; Strauss, S. H. $K_2B_{12}F_{12}$ A rare A_2X structure for an ionic compound at ambient conditions. *Journal of Fluorine Chemistry* **2010**, *131*, 1252–1256.
18. **Peryshkov, D. V.**; Goreshnik, E.; Mazej, Z.; Strauss, S. H. Co-crystallization of octahedral and icosahedral fluoroanions in $K_3(AsF_6)(B_{12}F_{12})$ and $Cs_3(AsF_6)(B_{12}F_{12})$ Rare examples of salts containing fluoroanions with different shapes and charges. *Journal of Fluorine Chemistry* **2010**, *131*, 1225–1228.

17. **Peryshkov, D. V.**; Popov, A. A.; Strauss, S. H. Latent Porosity in Potassium Dodecafluorocloso-dodecaborate(2-). Structures and Rapid Room Temperature Interconversions of Crystalline $K_2B_{12}F_{12}$, $K_2(H_2O)_2B_{12}F_{12}$, and $K_2(H_2O)_4B_{12}F_{12}$ in the Presence of Water Vapor. *Journal of the American Chemical Society* **2010**, *132*, 13902–13913.
16. Shackelford, S. A.; Belletire, J. L.; Boatz, J. A.; Schneider, S.; Wheaton, A. K.; Wight, B. A.; Ammon, H. L.; **Peryshkov, D. V.**; Strauss, S. H. Bridged Heterocyclium Dicationic closo-Icosahedral Perfluoroborane, Borane, and Carborane Salts via Aqueous, Open-Air Benchtop Synthesis. *Organic Letters* **2010**, *12*, 2714–2717.
15. **Peryshkov, D. V.**; Popov, A. A.; Strauss, S. H. Direct Perfluorination of $K_2B_{12}H_{12}$ in Acetonitrile Occurs at the Gas Bubble-Solution Interface and Is Inhibited by HF. Experimental and DFT Study of Inhibition by Protic Acids and Soft, Polarizable Anions. *Journal of the American Chemical Society* **2009**, *131*, 18393–18403.
14. Shustova, N. B.; **Peryshkov, D. V.**; Kareev, I. E.; Boltalina, O. V.; Strauss, S. H. 1,4,7,11,18,21,24,31,35,39,51,58,61,64-Tetradecakis(trifluoromethyl)-1,4,7,11,18,21,24,31,35,39,51,58,61,64-tetradecahydro($C_{70}-D_{5h}$)[5,6]fullerene p-xylene trisolvate. *Acta Crystallographica Section E-Structure Reports Online* **2007**, *63*, O3928–U1876.
13. Shustova, N. B.; **Peryshkov, D. V.**; Boltalina, O. V.; Strauss, S. H. 1,4,10,19,25,41,55,60,67,69-Decakis(trifluoromethyl)-1,4,10,19,25,41,55,60,67,69-decahydro($C_{70}-D_{5h}$)[5,6] fullerene. *Acta Crystallographica Section E-Structure Reports Online* **2007**, *63*, O4073–U3278.
12. Shustova, N. B.; **Peryshkov, D. V.**; Kareev, I. E.; Boltalina, O. V.; Strauss, S. H. 1,6,11,16,18,24,27,36-octakis(trifluoromethyl)-1,6,11,16,18,24,27,36-octahydro($C_{60}-I_h$)[5,6]fullerene deuteriochloroform solvate. *Acta Crystallographica Section E-Structure Reports Online* **2007**, *63*, O3398–U2441.
11. Shustova, N. B.; **Peryshkov, D. V.**; Popov, A. A.; Boltalina, O. V.; Strauss, S. H. 1,6,11,18,24,27,33,51,54,60-decakis(trifluoromethyl)-1,6,11,18,24,27,33,51,54,60-decahydro($C_{60}-I_h$)[5,6]fullerene. *Acta Crystallographica Section E-Structure Reports Online* **2007**, *63*, O3129–U2823.
10. Kareev, I. E.; Shustova, N. B.; **Peryshkov, D. V.**; Lebedkin, S. F.; Miller, S. M.; Anderson, O. P.; Popov, A. A.; Boltalina, O. V.; Strauss, S. H. X-ray structure and DFT study of $C_{1-C_{60}}(CF_3)_{12}$. A high-energy, kinetically-stable isomer prepared at 500 °C. *Chemical Communications* **2007**, 1650–1652.
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8. Shlyakhtina, A. V.; Knotko, A. V.; Boguslavskii, M. V.; Stefanovich, S. Y.; Kolbanev, I. V.; **Peryshkov, D. V.**; Shcherbakova, L. G. Influence of structural defects on the electrical conductivity of $(Yb_{1-x}Sc_x)_2Ti_2O_7$ ($x=0, 0.09, 0.3$). *Inorganic Materials* **2005**, *41*, 406–411.

7. Goodilin, E. A.; **Peryshkov, D. V.**; Presnyakov, I. A.; Didenko, K. V.; Tretyakov, Y. D. A comparative Mossbauer study of the $\text{Nd}_{1+x}\text{Ba}_{2-x}(\text{Cu}_{0.97}^{57}\text{Fe}_{0.03})_3\text{O}_z$ solid solution: the role of low-temperature treatment. *Superconductor Science & Technology* **2004**, *17*, 1353–1360.
6. Goodilin, E. A.; **Peryshkov, D. V.**; Didenko, K. V.; Makarova, M. V.; Tretyakov, Y. D. Dynamics of cation ordering in an intentionally prepared low-T-c pseudocubic $\text{NdBa}_2\text{Cu}_3\text{O}_{6.9}$ phase. *Superconductor Science & Technology* **2004**, *17*, 1341–1345.
5. **Peryshkov, D. V.**; Goodilin, E. A.; Presnyakov, I. A.; Didenko, K. V.; Tretyakov, Y. D.; Birkner, A.; Grunert, W. Thermal instability of a cation-disordered $\text{NdBa}_2\text{Cu}_3\text{O}_7$ superconductor. *Mendeleev Communications* **2004**, 161–163.
4. Tretyakov, Y. D.; Goodilin, E. A.; **Peryshkov, D. V.**; Itkis, D. M. Structural and microstructural features of functional materials based on cuprates and manganites. *Uspekhi Khimii* **2004**, *73*, 954–973.
3. **Peryshkov, D. V.**; Gudilin, E. A.; Makarova, M. V.; Pomerantseva, E. A.; Mudretsova, S. N.; Maiorova, A. F.; Tretyakov, Y. D. Dynamics of cation ordering in the superconducting $\text{NdBa}_2\text{Cu}_3\text{O}_7$ phase. *Doklady Chemistry* **2002**, *387*, 323–327.
2. Didenko, K. V.; **Peryshkov, D. V.**; Gudilin, E. A.; Presnyakov, I. A.; Pomerantseva, E. A.; Tretyakov, Y. D. Specific features of the local structure of quasi-cubic lanthanide barium cuprates $\text{Nd}_{1+x}\text{Ba}_{2-x}((\text{Cu}_{0.97}^{57}\text{Fe}_{0.03})_3\text{O}_{7-z})$ ($x=0, 0.6$). *Doklady Chemistry* **2002**, *387*, 316–321.
1. **Peryshkov, D. V.**; Gudilin, E. A.; Makarova, M. V.; Trofimenko, E. A.; Mudretsova, S. N.; Maiorova, A. F.; Tretyakov, Y. D. Evolution of the superconducting $\text{NdBa}_2\text{Cu}_3\text{O}_z$ phase upon isothermal annealing. *Doklady Chemistry* **2002**, *383*, 105–109.

Thesis Advisor and Postgraduate-Scholar Sponsor:

Graduate Students:

2013–present	Bennet J. Eleazer (University of South Carolina)
2013–present	Md Mamdudur Rahman (University of South Carolina)
2014–2016 (M.S.)	Surendra Karki (University of South Carolina)
2015–present	Md Jahirul Islam (University of South Carolina)
2015–present	Dmitry Royzman (University of South Carolina)
2017–present	Gayathri Gange (University of South Carolina)
2017–present	Chathumal Jayaweera (University of South Carolina)

Postdoctoral Fellows:

2015–2017	Dr. Yuenn Onn Wong (University of South Carolina)
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Funding

National Science Foundation, “CAREER: Carborane Cluster Architectures Featuring Multiple Metal-Boron Interactions” 2017–2022 (active) \$709,725

American Chemical Society Petroleum Research Fund, “Electron-Donating Carboranyl Ligands for Iron-Catalyzed Hydrocarbon Oxidation” 2014–2016 (completed) \$110,000

Office of the USC Vice President for Research, ASPIRE I, Track I. “The Role of Boron-Metal Bonds in Cooperative Activation of Small Molecules” 2015–2016 (completed) \$15,000