

Vladimir Benin

Professor

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EDUCATION

- ◆ Ph.D. (Organic Chemistry), Vanderbilt University, 1995
 - Research Adviser: Prof. J. C. Martin
 - Dissertation title: "New Silicon and Germanium Compounds Stabilized by Tridentate Ligands"
- ◆ MS (Organic Chemistry), Vanderbilt University, 1993
- ◆ BS (Chemistry), University of Sofia, BG, 1990

RESEARCH AND WORK EXPERIENCE

- ◆ 08/07 – present: University of Dayton, Associate Professor
- ◆ 08/01 – 08/07: University of Dayton, Assistant Professor
- ◆ 07/99 – 08/01: Vanderbilt University, Research Associate
- ◆ 09/98 - 06/99: Bilkent University, Ankara, TR, Visiting Assistant Professor
- ◆ 04/97 - 08/98: Vanderbilt University, Research Associate
- ◆ 02/95 - 04/97: Cornell University, Research Associate

COURSES REGULARLY TAUGHT

- ◆ Organic Chemistry (CHM 313 and 314)
- ◆ Intermediate Organic Chemistry (CHM 412/512)
- ◆ Biosynthetic Organic Chemistry (CHM 426/536)
- ◆ General Chemistry (CHM 123 and 124)
- ◆ Energy Resources (CHM 234)

JOURNAL ARTICLE PUBLICATIONS

- 1) Morgan, A. B.; Benin, V.; Klosterman, D. A.; Bin Sulayman, A.; Mukhtar, M.; Galaska, M. "Organophosphorus-hydrazides as potential reactive flame retardants for epoxy" *J. Fire. Sci.* **2020**, 38(1), 28 – 52
- 2) Byard, B.; Wang, K.; Morgan, A.; Benin, V. "New polyether diols as flame retardants for polyurethane: Derivatives of epoxy-functionalized phosphonates and phosphates" *Fire and Materials* **2018**, 42, 3 – 17
- 3) Wang, K.; Morgan, A.B.; Benin, V. "Preparation and Studies of New Phosphorus-containing Diols as Potential Flame Retardants" *Fire and Materials* **2017**, 41(8), 973 – 983

- 4) Benin, V.; Cui, X.; Morgan, A. B.; Seiwert, K. "Synthesis and Flammability Testing of Epoxy Functionalized Phosphorous-based Flame Retardants" *J. Appl. Polym. Sci.* **2015**, *132* (30), DOI: 10.1002/APP.42296
- 5) Benin, V.; Gardelle, B.; Morgan, A. B. "Heat Release of Polyurethanes Containing Potential Flame Retardants Based on Boron and Phosphorus Chemistries" *Polym. Degr. Stab.* **2014**, *106*, 108 – 121
- 6) Kuttler, A.; Durganala, S.; Fratini, A.; Morgan, A. B.; Benin, V. "Structure, Theoretical Studies, and Coupling Reactions of Some New Cyclic Boronic Esters" *Heteroatom Chem.* **2013**, *24*(5), 361 - 371
- 7) Knachel, H. C.; Benin, V.; Moddeman, W. E.; Birkbeck, J. C.; Kestner, T. A.; Young, T. L. "Characterization by NMR of Reactants and Products of Hydrofluoroether Isomers, $\text{CF}_3(\text{CF}_2)_3\text{OCH}_3$ and $(\text{CF}_3)_2\text{C}(\text{F})\text{CF}_2\text{OCH}_3$, Reacting with Isopropyl Alcohol" *Magn. Reson. Chem.* **2013**, *51*, 407–413
- 8) Ivan, N.; Benin, V.; Morgan, A. "Preparation of Phosphonoterephthalic Acids via Palladium-Catalyzed Coupling of Aromatic Iodoesters" *Synth. Commun.* **2013**, *43*, 1831, 1836
- 9) Knachel, H. C.; Benin, V.; Barklay, C. D.; Birkbeck, J. C.; Faubion, B. D.; Moddeman, W. E. "Reactions of Methyl Perfluoroalkyl Ethers with Isopropyl Alcohol: Experimental and Theoretical Studies" *Ind. Eng. Chem. Res.* **2012**, *51*, 10525 – 10534
- 10) Benin, V.; Durganala, S.; Morgan, A. B. "Synthesis and Flame Retardant Testing of New Boronated and Phosphonated Aromatic Compounds" *J. Mater. Chem.* **2012**, *22*, 1180 – 119021
- 11) Simmons, S.; Fratini, A.; Benin, V. "A Sodium Salt of the Dimer of Boronoterephthalic Acid Anhydride" *Acta. Cryst. C* **2011**, *C67*, m123 - m125
- 12) Hedian, H.; Benin, V. "The Tetrafluoroborate Salt of 4-Methoxybenzyl N-2-(dimethylamino)ethyl-N-nitrosocarbamate: Synthesis, Crystal Structure and DFT Calculations" *J. Chem. Crystallogr.* **2011**, *41*, 1976 – 1980
- 13) Horwath, M.; Benin, V. "Theoretical Investigation of a Reported Antibiotic from the "Miracle Tree" *Moringa Oleifera*" *Comp. Theor. Chem.* **2011**, *965*, 196 – 201
- 14) Venkata, S. N. A., Shamo, E., Benin, V. "Preparation and Characterization of Some Substituted Benzyl N-nitrosocarbamates Containing an N-2-(methylthio)ethyl or a Bis(2-aminoethyl)sulfide Functionality" *Synthetic Communications* **2009**, *39*, 1406 – 1414
- 15) Benin, V., Yeates, A. T., Dudis, D. "Preparation of Halogenated Derivatives of Thiazolo[5,4-d]thiazole via Direct Electrophilic Aromatic Substitution" *J. Heterocyclic Chem.* **2008**, *45*, 811 – 819
- 16) Horwath, M., Benin, V. "C - N Bond Rotation and E - Z Isomerism in Some N-Benzyl-N-Methylcarbamoyl Chlorides: A DFT Study" *J. Mol. Struct. (THEOCHEM)* **2008**, *850*, 105 – 110
- 17) Branion, S., Benin V. "Preparation of Some Substituted Terephthalic Acids" *Synthetic Communications* **2006**, *36*, 2121 – 2127
- 18) Benin, V. "Secondary N-nitrosocarbamate anions: Structure and alkylation reactions. A DFT study" *J. Mol. Struct.: THEOCHEM* **2006**, *764*, 21 – 31
- 19) Thakkalapally, A.; Benin, V. "Synthesis, structural studies and desilylation reactions of some N-2-(trimethylsilyl)ethyl-N-nitrosocarbamates" *Tetrahedron* **2005**, *61*, 4939 – 4948

- 20) Manka, J. T., Guo F., Huang J., Yin H., Farrar, J. M., Sienkowska M., Benin V., and Kaszynski, P. "Synthesis of Polyfunctionalized Biphenyls as Intermediates for a New Class of Liquid Crystals" *J. Org. Chem.* **2003**, 68, 9574 – 9588
- 21) Benin, V.; Kaszynski, P.; Radziszewski, G. "The Ambident Ethyl N-Nitrosocarbamate Anion: Experimental and Computational Studies of Alkylation and Thermal Stability", *J. Am. Chem. Soc.* **2002**, 124, 14115
- 22) Benin, V.; Kaszynski, P.; Radziszewski, G. "Arylpentazoles Revisited: Experimental and Theoretical Studies of 4-Hydroxyphenylpentazole and 4-Oxophenylpentazole Anion", *J. Org. Chem.* **2002**, 67, 1354
- 23) Benin, V.; Kaszynski, P.; Radziszewski, G. "N-Chloro-N,N',N'-tris(ethoxycarbonyl) hydrazine and N,N-Dichloro-N',N'-bis(ethoxycarbonyl)hydrazine: Synthesis, Stability and Reactions with Nucleophiles", *Tetrahedron* **2002**, 58, 2085
- 24) Benin, V.; Kaszynski, P. "Cinnolino[5,4,3][c,d,e][1,2]benzothiazin-4-yl: A New Persistent Radical" *J. Org. Chem.*, **2000**, 65, 8086
- 25) Benin, V.; Kaszynski, P. "Formation of 1,10-disubstituted benzo[c]cinnolines. Synthesis and Molecular Structure of 1-Amino-10-propylthiobenzo[c]cinnoline and Cyclization to 4-Propylcinnolino[5,4,3][c,d,e][1,2] benzothiazine" *J. Org. Chem.* **2000**, 65, 6388
- 26) Sienkowska, M.; Benin, V.; Kaszynski, P. "Preparation and NMR Analysis of 2,6-Heterodifunctional Halobenzenes as Precursors for Substituted Biphenyls" *Tetrahedron* **2000**, 56, 165
- 27) Benin, V.; Martin, J. C.; Willcott, M. R. "Solution and Solid State Studies of Some new Silicon and Germanium Compounds Stabilized by Tridentate Ligands" *Tetrahedron* **1997**, 53, 10133
- 28) Benin, V.; Martin, J. C.; Willcott, M. R. "Low Temperature NMR Evidence Shows the Elusive Siliconium Ion is a Further Example of Tautomeric Equilibrium" *Tetrahedron Lett.* **1994**, 35, 2133
- 29) Dobrev, A.; Benin, V.; Nechev, L. "α-Amidoalkylation of Ambident Nucleophiles by Means of N-benzoylbenzaldimine" *Liebigs Ann. Chem.* **1992**, 863

BOOKS AND BOOK CHAPTERS

- 1) Benin, V., Knachel, H. "Theoretical Studies on Degradation Reactions of Hydrofluoroethers in the Presence of Water and Isopropyl Alcohol", in *Investigations of the Reactions of HFE-7100/IPA Near-Azeotropic Mixtures with Water*, Moddeman, W. E., Birkbeck, J. C. (Eds.), B & W Pantex, Amarillo, TX, **2010**, pp. 3.1 – 3.22
- 2) Benin, V. A. "Other Tetrazines and Pentazines", in *Comprehensive Heterocyclic Chemistry III*, Katritzky, A. R., Ramsden, C. A., Scriven, E. F., Taylor, R. J. (Eds.), Oxford: Elsevier, **2008**, vol. 9, pp. 715 – 736

CONFERENCE PRESENTATIONS (National and International, last 5 years)

- ♦ Morgan, A. B.; Benin, V.; Klosterman, D. A.; Mukhtar, M.; Bin Sulayman, A.; Galaska, M. "Organophosphorus-hydrazides as potential reactive flame retardants for epoxy" *European Meeting on Fire Retardant Polymeric Materials*, Turku, Finland, June 26 – 28, **2019**

- ♦ Morgan, A. B.; Benin, V.; Klosterman, D. A.; Mukhtar, M.; Bin Sulayman, A.; Galaska, M. "Organophosphorus-hydrazides as potential reactive flame retardants for epoxy" *30th Annual Conference on Recent Advances in Flame Retardancy of Polymeric Materials (2019 BCC Flame Meeting)*, San Antonio, TX, May 19 – 22, **2019**
- ♦ Benin, V., Wang, K.; Morgan, A. B. "Preparation and Studies of New Phosphorus-containing Diols as Potential Flame Retardants" *252nd ACS National Meeting*, Philadelphia, PA, August 21 – 25, **2016**
- ♦ Benin, V., Morgan, A. B. "New Phosphate Epoxy Flame Retardants for Polyurethanes" *14th International Fire and Materials Conference*, San Francisco, CA, February 4, **2015**
- ♦ Seiwert, K.; Cui, X.; Morgan, A. B.; Benin, V. "Preparation of New Epoxy-functionalized Phosphonate and Phosphate Esters as Reactive Flame Retardants for Polyurethane" *246th ACS National Meeting*, Indianapolis, IN, September 8 - 12, **2013**
- ♦ Ivan, N.; Benin, V.; Durganala, S.; Morgan, A. "Synthesis of new boronated and phosphonated aromatic flame retardants" *243rd ACS National Meeting*, San Diego, CA, March 25 – 29, **2012**
- ♦ Benin, V.; Durganala, S.; Morgan, A. "Small scale flammability testing of phosphonate and boronate + polyurethane blends" *243rd ACS National Meeting*, San Diego, CA, March 25 – 29, **2012**

RECENT GRANTS AND CONTRACTS

- ♦ Erb, J. (PI), Benin, V. (co-PI), Krane, C. M. (co-PI), Biffinger, J., Masthay, M. B., Swavey, S. M., "Major Research Acquisition (MRI) Request for new 400 MHz NMR", *National Science Foundation (NSF)*, **\$443,788.00, 2020**
- ♦ Benin, V. (Principal), Morgan, A. B. (Co-Principal) "New Non-Halogenated Flame Retardant Chemistries" *Israeli Chemical Ltd. (ICL)*, **\$65,000.00**, May 01, **2014** – June 30, **2015**
- ♦ Benin, V. (Co-Principal), Morgan, A. B. (Principal) "Flame Retardant Technology Discovery and Flammability Method Development" *National Institute for Standards and Technology (NIST)*, **\$370,000.00**, September 1, **2012** - August 31, **2015**
- ♦ Benin, V. (Co-Principal), Morgan, A. B. (Principal) "Research and Development on New Flame Retardant Chemistries for Polyurethane" *National Institute for Standards and Technology (NIST)*, **\$300,000.00**, September 1, **2009** - August 31, **2012**