

Publications 2022

J. Rackham, B. Newbold, D. Griner, D. Smith, Y. Cai, R. G. Harrison, A. Reid, J. Kortright, M. Transtrum, K. Chesnel, “Emergent antiferromagnetic inter-particle couplings in monolayers of Fe₃O₄ nanoparticles throughout the superparamagnetic blocking transition” *Phys. Rev. B*, **2022**, submitted.

W. N. Chan, R. G. Harrison “Separation of perfluoroalkyl substances by ion chromatography with a resorcinarene stationary phase” *Sep Sci*, **2022**, accepted.

B. Dearden, A. Edwards, Z. Evans, B. Woolsey, C. Blair, N. G. Harrison, R. G. Harrison, “Synthesis of zinc oxide nanoplates and their use for hydrogen sulfide adsorption” *J Sol-Gel Sci Technol* **2022**, *101*, 279-286.

P. A. Kim, D. Choe, H. So, S. Park, B. Suh, S. Jeong, K-T. Kim, C. Kim, R. G. Harrison, “A selective fluorescence sensor for hypochlorite used for the detection of hypochlorite in zebrafish” *Spectrochimica Acta A*, **2021**, *261*, 120059.

B. A. Frandsen, C. Read, J. Stevens, C. Walker, M. Christiansen, R. G. Harrison, K. Chesnel, “Superparamagnetic dynamics and blocking transition in Fe₃O₄ nanoparticles probed by vibrating sample magnetometry and muon spin relaxation” *Phys. Rev. Materials* **2021**, *5*, 054411.

K. L. McGuire, P. Smit, D. H. Ess, J. T. Hill, R. G. Harrison, D. D. Busath, “Mechanism and kinetics of copper complexes binding to the influenza A M2 S31N and S31N/G34E channels” *Biophysical J.*, **2021**, *120/1*, 168.

W. N. Chan, J. P. Warren, S. P. Krieger, B. L. Vestal, R. G. Harrison, “Separation and preconcentration of perrhenate from ionic solutions by ion exchange chromatography” *J. Chromatogr. A*, **2020**, *1631*, 461588.

S. Klomp, C. Walker, M. Christiansen, C. Wilkinson, B. Newbold, D. Griner, Y. Cai, P. Minson, J. Farrer, S. J. Smith, B. J. Campbell, R. G. Harrison, K. Chesnel, “Size-dependent crystalline and magnetic properties of 5 to 100 nm Fe₃O₄ nanoparticles: superparamagnetism, Verwey transition and core-shell formation” *IEEE Trans. Magn.*, **2020**, *56*, 2300109.

A. Ahamed, R. G. Harrison, N. Nawar, S. J. Smith, M. M. Mostafa, “Synthesis, single crystal X-ray, spectroscopic characterization and biological activities of Mn²⁺, Co²⁺, Ni²⁺ and Fe³⁺ complexes” *J. Mol. Struct.*, **2020**, *1203*, 127240, [doi:10.1016/j.molstruc.2019.127240](https://doi.org/10.1016/j.molstruc.2019.127240).

T. Panahi, H. L. Anderson, K. I. Castro, J. D. Lamb, R. G. Harrison, “Distinguishing Amines with an Amino Acid Appended Resorcinarene-Based Cavitand” *Supramol. Chem.*, **2020**, *32*, 71-80. DOI: 10.1080/10610278.2019.1692138.

- K. McGuire, J. Hogge, A. Hintze, N. Liddle, N. Nelson, J. Pollock, A. Brown, S. Walker, J. Lynch, R. G. Harrison, D. D. Busath, "Copper Complexes as Influenza Antivirals: Reduced Zebrafish Toxicity" *Noble Metals in Medicine*, **2019**, doi: 10.5772/intechopen.88786.
- J. Rackham, B. Newbold, S. Kotter, D. Smith, D. Griner, R. G. Harrison, Al H. Reid, M. Transtrum, K. Chesnel, "Modeling magnetic correlations in magnetite nanoparticle assemblies using x-ray magnetic scattering data" *AIP Advances*, **2019**, 9, 035033, doi: 10.1063/1.5080155.
- M. Yang, J. B. Chae, C. Kim, R. G. Harrison, "Visible Chemosensor for Fe(II), Co(II) and Cu(II) in Aqueous Solution" *Photochem Photobiol Sci*, **2019**, 18, 1249-1258, DOI: 10.1039/C8PP00545A.
- K. Chesnel, D. Griner, D. Smith, Y. Cai, M. Trevino, B. Newbold, R. G. Harrison, T. Wang, T. Liu, E. Jal, A. Reid, "Unraveling nanoscale magnetic ordering in Fe₃O₄ nanoparticle assemblies via X-rays" *Magnetochemistry*, **2018**, 4, 42.
- B. Raymond, K. C. Merrill, R. G. Harrison, S. D. Jarvis, R. J. Rasmussen, "The nicotine content of a sample of e-cigarette liquid manufactured in the United States" *J. Addiction Med.*, **2018**, 12, 127-131.
- B. Hallac, J. Brown, E. Stavitski, R. G. Harrison, M. Argyle "In-Situ UV-Visible Assessment of Iron-Based High-Temperature Water-Gas Shift Catalysts Promoted with Lanthana: An Extent of Reduction Study" *Catalysts* **2018**, 8, 63, doi:10.3390/catal8020063.
- J. M. Jung, C. Kim, R. G. Harrison "A Dual Sensor Selective for Hg²⁺ and Cysteine Detection" *Sens Actuators: B Chem.* **2018**, 255, 2756-2763.
- N. Gordon, K. McGuire, S. Wallentine, G. Mohl, J. Lynch, R. G. Harrison, D. Busath "Divalent copper complexes as influenza A inhibitors" *Antiviral Research* **2017**, 147, 100-106.
- J. M. Hancock, W. M. Rankin, B. Woolsey, R. S. Turley, R. G. Harrison "Controlled Formation of ZnO Hexagonal Prisms Using Ethanolamines and Water" *J Sol-Gel Sci Technol* **2017**, 84, 214-221.
- J. M. Jung, J. J. Lee, E. Nam, M. H. Lim, C. Kim, R. G. Harrison "A zinc fluorescent sensor used to detect mercury(II) and hydrosulfide" *Spectrochimica Acta A.*, **2017**, 178, 203-211.
- R. M. Izatt, J. S. Bradshaw, S. R. Izatt, R. G. Harrison "The Izatt-Christensen Award in Macrocyclic and Supramolecular Chemistry: A 25 Year History (1991-2016)" John Wiley & Sons, 2016, pg 1-9.
- T. Panahi, D. J. Weaver, J. D. Lamb, R. G. Harrison "A new approach for trace analysis of guanidine compounds in surface water with resorcinarene-based ion chromatography columns" *Analyst*, **2016**, 141, 939-946.

A. A. Mohammed, A. G. M. Al-Daher, J. A. Mohamad, R. G. Harrison "Synthesis and characterization of polydentate macrocyclic Schiff bases (18-membered atoms) and their complex with cobalt(II), nickel(II), copper(II) and zinc(II) ions" *Inter. J. Enhanced Res. Sci. Tech. Engineering*, **2015**, 4, 440-447.

A. A. Mohammed, A. M. Al-Daher, H. A. Mohamad, R. G. Harrison "Synthesis and characterization of polydentate macrocyclic Schiff bases (14-membered atoms) and their complexes with Co(II), Ni(II), Cu(II), and Zn(II) ions" *Res. J. Chem. Sci.* **2015**, 5, 12-19.

T. Panahi, D. J. Weaver, J. D. Lamb, R. G. Harrison "Separation of Uremic Toxins from Urine with Resorcinarene-based Ion Chromatography Columns" *J. Chromatogr. A*, **2015**, 1376, 105-111.

N. Bair, J. M. Hancock, C. J. Simonson, S. W. Thalman, J. S. Colton, M. C. Asplund, R. G. Harrison "Assemblies composed of oligothiophene-ruthenium complexes bound to CdSe nanoparticles" *J. Luminescence* **2015**, 158, 501-509.

E. J. Song, G. J. Park, J. J. Lee, S. Lee, I. Noh, Y. Kim, S.-J. Kim, C. Kim, R. G. Harrison "A fluorescence sensor for Zn^{2+} that also acts as a visible sensor for Co^{2+} and Cu^{2+} " *Sens. Actuators: B Chem.* **2015**, 213, 268-275.

J. M. Hancock, W. M. Rankin, T. M. Hammad, J. K. Salam, K. Chesnel, R. G. Harrison "Optical and magnetic properties of ZnO nanoparticles doped with Co, Ni, and Mn and synthesized at low temperature" *J. Nanosci. Nanotech.* **2015**, 15, 3809-3815.

H. Kim, G. R. You, G. J. Park, J. Y. Choi, I. Noh, Y. Kim, S.-J. Kim, C. Kim, R. G. Harrison "Selective zinc sensor based on pyrazoles and quinoline used to image cells" *Dyes and Pigments* **2015**, 113, 723-729.

K. Chesnel, M. Trevino, Y. Cai, J. M. Hancock, S. J. Smith, R. G. Harrison "Particle size effects on the magnetic behavior of 5 to 11 nm Fe_3O_4 nanoparticles" *J. Phys.* **2014**, 521, doi:10.1088/1742-6596/521/1/012004.

Y. P. Cai, K. Chesnel, M. Trevino, A. Westover, R. G. Harrison, J. M. Hancock, S. Turley, A. Scherz, A. Reid, B. Wu, C. Graves, T. Wang, T. Liu, H. Dürr "Orbital and spin moments of 5 to 11 nm Fe_3O_4 nanoparticles measured via X-ray magnetic circular dichroism" *J. Appl. Phys.* **2014**, 115, 17B537/1-17B537/3.

Y. Lee, H. G. Koo, S. P. Jang, A. B. Erdmann, S. S. Verneti, C. Kim, and R. G. Harrison "Synthesis of a Zn-salen Resorcinarene-based Cavitand and its Fluorescence Response to Nitro Compounds" *Supramolecular Chem.* **2014**, 26, 245-250.

N. Li, R. G. Harrison, J. D. Lamb "Application of resorcinarene derivatives in chemical separations" *J. Incl. Phenom.* **2014**, 78, 39-60.

E. J. Song, J. Kang, G. R. You, G. J. Park, Y. Kim, S.-J. Kim, C. Kim, R. G. Harrison "A Single Molecule that Acts as a Fluorescence Sensor for Zinc and Cadmium and Colorimetric Sensor for Cobalt" *Dalton Trans.* **2013**, 42, 15514-15520.

T. M. Hammad, J. K. Salem, R. G. Harrison, R. Hempelmann, N. K. Hejazy "Optical and magnetic properties of Cu-doped ZnO nanoparticles" *J. Mater. Sci: Mater. Electron.* **2013**, 24, 2846-2852.

N. Li, L. J. Allen, R. G. Harrison, J. D. Lamb "Transition metal cation separations with resorcinarene-based amino acid stationary phase" *Analyst*, **2013**, 138, 1467-1474.

J. H. Kim, I. H. Hwang, S. P. Jang, J. Kang, S. Kim, I. Noh, Y. Kim, C. Kim, R. G. Harrison "Zinc sensors with lower binding affinities for cellular imaging" *Dalton Trans.* **2013**, 42, 5500-5507.

G. Arena, R. P. Bonomo, L. I. Vagliasindi, V. Zito, J. D. Lamb, R. G. Harrison "Anion binding to a tetracopper resorcinarene-based complex" *Supramolecular Chem.* **2013**, 25, 158-165.

J. K. Salem, T. M. Hammad, R. G. Harrison "Synthesis, structural and optical properties of Ni-doped ZnO micro-spheres" *J. Mater. Sci: Mater. Electron.* **2013**, 24, 1670-1676.

H. G. Lee, J. H. Lee, S. P. Jang, I. H. Hwang, S.-J. Kim, Y. Kim, C. Kim, R. G. Harrison "Zinc selective chemosensors based on the flexible dipicolylamine and quinoline" *Inorg. Chim. Acta* **2013**, 394, 542-551.

T. M. Hammad, J. K. Salam, R. G. Harrison "Structure, optical properties and synthesis of Co-doped ZnO superstructures" *Appl. Nanosci.* **2013**, 3, 133-139.

N. Li, F. Yang, H. A. Stock, D. V. Dearden, J. D. Lamb, R. G. Harrison "Cavitands with chiral substituents: resorcinarene-based cavitands with amino acid functional groups" *Org. Biomol. Chem.*, **2012**, 10, 7392-7401.

N. Li, C. English, A. Eaton, A. Gillespie, T. C. Ence, T. J. Christensen, A. Sego, R. G. Harrison, J. D. Lamb "Cation separation and preconcentration using columns containing cyclen and cyclen-resorcinarene derivatives" *J. Chromatogr. A*, **2012**, 1245, 83-89.

S. Bali, G. Bali, F. E. Huggins, M. S. Seehra, V. Singh, J. M. Hancock, R. G. Harrison, G. P. Huffman, R. J. Pugmire, R. D. Ernst, E. M. Eyring "Synthetic doped amorphous ferrihydrite for the Fischer-Tropsch synthesis of alternative fuels" *Ind. Eng. Chem. Res.* **2012**, 51, 4515-4522.

H. G. Lee, J. H. Lee, S. P. Jang, H. M. Park, S.-J. Kim, Y. M. Kim, C. Kim, R. G. Harrison "Zinc Selective Chemosensor Based on Pyridyl-amide Fluorescence" *Tetrahedron* **2011**, 67, 8073-8078.

T. M. Hammad, J. K. J. Salem, R. G. Harrison "The influence of annealing temperature on the structure, morphologies and optical properties of ZnO nanoparticles" *Superlattices and Microstruct.* **2010**, 47, 335-340.

J. Wang, J. D. Lamb, L. D. Hansen, R. G. Harrison "Multiple Anion Binding by a Zinc-containing Tetratopic cyclen-resorcinarene" *J. Incl. Phenom.* **2010**, 67, 55-61.

J. Wang, R. G. Harrison, J. D. Lamb "Anion Separation and Preconcentration with cyclen-resorcinarene derivatives" *J. Chromatogr. Sci.* **2009**, 47, 510-515.

T. M. Hammad, J. K. J. Salem, R. G. Harrison "Synthesis, characterization, and optical properties of Y-doped ZnO nanoparticles" *NANO* **2009**, 4, 225-232.

J. K. J. Salem, T. M. Hammad, R. G. Harrison, "ZnO Nanoparticles Prepared in the Presence of Additives by Thermal decomposition Method" *International J. Nanoscience* **2009**, 8, 465-472.

R. G. Harrison, A. L. Washburn, A. T. Pickett, D. M. Call, "Assembly of CdSe Nanoparticles into Microspheres by a Liquid Droplet Emulsion Process" *J. Mater. Chem.* **2008**, 18, 3718-3722.

J. D. Lamb, C. A. Morris, J. N. West, K. T. Morris, R. G. Harrison, "Cation Effect on Anion Separations by Aza-crown Ligands in Liquid Membranes" *J. Membrane Sci.* **2008**, 321, 15-21.

J. S. Bair, R. G. Harrison, "Synthesis and Optical Properties of Bifunctional Thiophene Molecules Coordinated to Ruthenium" *J. Org. Chem.* **2007**, 72, 6653-6661.

K. M. Shin, G. D. Watt, B. Shang, J. N. Harb, R. G. Harrison, S. I. Kim, S. J. Kim, "Electrochemical Analysis of the Reduction of Ferritin Using Oxidized Methyl Viologen" *J. Electroanal. Chem.* **2006**, 598, 22-26.

T. J. Lowery, P. E. Wilson, B. Zhang, J. Bunker, R. G. Harrison, A. C. Nyborg, D. Thiriot, G. D. Watt, "Flavodoxin Hydroquinone Reduces Azotobacter Vinelandii Fe Protein to the All-ferrous Redox State with a $S = 0$ Spin State" *Proc. Natl. Acad. Sci. U.S.A.* **2006**, 103, 17131-17136.

J. S. Gardner, R. G. Harrison, J. D. Lamb, D. V. Dearden, "Sonic Spray Ionization Mass Spectrometry: A Powerful Tool Used to Characterize Fragile Metal-Assembled Cages" *New J. Chem.* **2006**, 30, 1276-1282.

C. K. Knox, S. D. Fillmore, D. M. Call, D. G. Allen, R. C. Davis, B. C. Hess, W. E. Evanson, R. G. Harrison "Synthesis and Characterization of Photoluminescent In-doped CdSe Nanocrystals" *J. Colloid Interface Sci.* **2006**, 591-596.

J. S. Gardner, Q. P. Peterson, J. O. Walker, B. D. Jensen, B. Adhikary, R. G. Harrison, J. D. Lamb "Anion Transport Through Polymer Inclusion Membranes Facilitated by Transition Metal Containing Carriers" *J. Membrane Sci.* **2006**, 277, 165-176.

R. G. Harrison, J. L. Burrows, L. D. Hansen, "Selective Guest Encapsulation by a Cobalt-Assembled Cage Molecule" *Chem. Eur J.* **2005**, 11, 5881-5888.

J. S. Gardner, M. Conda-Sheridan, D. N. Smith, R. G. Harrison, J. D. Lamb "Anion Binding by a Tetradipicolylamine-Substituted Resorcinarene Cavitand" *Inorg. Chem.* **2005**, *44*, 4295-4300.

S. K. Chattopadhyay, K. Mitra, S. Biswas, S. Naskar, D. Mishra, B. Adhikary, R. G. Harrison, J. F. Cannon, "Reaction of *cis*-Ru(bpy)₂Cl₂ with 1-phenyl 5-(aminophenyl) 9-(2-pyridyl) benzimidazole derivatives: crystal structures of *N*-(4-chlorophenyl) imidazo[1,5a] pyridine and *cis*-[Ru(bpy)₂(MeCN)₂](ClO₄)₂" *Trans. Met. Chem.* **2004**, *29*, 1-6.

R. G. Harrison, J. L. Burrows, N. K. Dalley, "Incorporation of Transition and Group I Metal Ions into the Channels of Materials Composed of Metal-Assembled Cages" *Inorg. Chim. Acta*, **2003**, *351*, 399-403.

Q. Wu, M. L. Lee, R. G. Harrison, "Performance of Metal Complex substituted Polysiloxanes in Capillary Electrophoresis and Capillary Electrochromatography" *J. Chromatogr. A*, **2002**, *967*, 289-301.

S. R. Haines, R. G. Harrison, "Novel Resorcinarene-Based pH-Triggered Gelator" *Chem. Commun.* **2002**, 2846-2847.

Q. Wu, M. L. Lee, R. G. Harrison, "Metal Complex-Substituted Polysiloxanes as Novel Coatings for Capillary Electrophoresis and Capillary Electrochromatography" *J. Chromatogr. A*, **2002**, *954*, 247-258.

S. Zhu, W. W. Brennessel, R. G. Harrison, L. Que, Jr. "Iron Coordination Chemistry of *N*-(Bis(2-pyridyl)methyl)pyridine-2-carboxamide" *Inorg. Chem. Acta*, **2002**, *337*, 32-38.

R. G. Harrison, O. Danny Fox, Mark O. Meng, N. Kent Dalley, L. J. Barbour, "Cation Control of Pore and Channel Size in Cage-Based Metal-Organic Porous Materials" *Inorg. Chem.* **2002**, *41*, 838-843.

N. K. Dalley, G. Xue, J. S. Bradshaw, X. X. Zhang, R. G. Harrison, P. B. Savage, K. E. Krakowiak, R. M. Izatt, "A New Diaza-18-Crown-6 Ligand Containing Two Quinolin-8-ylmethyl Side Arms: Crystal Structures and Characterization of the Ligand, the Protonated Ligand and Its Mononuclear Barium(II) and Dinuclear Copper(II) Complexes" *Inorg. Chem.* **2001**, *40*, 1-9.

J. Kim, Y. Zang, R. G. Harrison, E. C. Wilkinson, L. Que, Jr. "A Nonheme Iron(II) Complex That Models the Redox Cycle of Lipoxxygenase" *J. Bio. Inorg. Chem.* **2001**, *6*, 276-284.

R. G. Harrison, N. K. Dalley, A. Y. Nazarenko, "Metal-Promoted Assembly of Organic-Based Cages into a Porous Material," *Chem. Commun.* **2000**, 1387-1388.

R. G. Harrison, "Multinuclear Metal Complexes and their Assembly into Cage Molecules," *Comments Inorg. Chem.* **2000**, *22*, 187-202.

O. D. Fox, J. F. Leung, J. M. Hunter, N. K. Dalley, R. G. Harrison, "Metal-Assembled Cobalt(II) Resorc[4]arene-Based Cage Molecules that Reversibly Capture Organic Molecules that Reversibly Capture Organic Molecules from Water and Act as NMR Shift Reagents," *Inorg. Chem.* **2000**, 39, 783-790.

O. D. Fox, N. K. Dalley, R. G. Harrison, "Synthesis and Characterization of a Novel Tetranuclear Copper(II) Resorc[4]arene Complex Possessing Four Structurally Different Copper Centers," *Inorg. Chem.* **2000**, 39, 620-622.

O. D. Fox, N. K. Dalley, R. G. Harrison, "Structure and Small Molecule Binding of a Tetranuclear Iron(II) Resorc[4]arene-Based Cage Complex," *Inorg. Chem.* **1999**, 38, 5860-5863.

O. D. Fox, N. K. Dalley, R. G. Harrison, "Structural Characterization of Appended Chiral Host Calix[4]resorcinarene Molecules," *J. Incl. Phenom.* **1999**, 33, 403.

O. D. Fox, N. K. Dalley, R. G. Harrison, "A Metal Assembled, pH-Dependent Resorcinarene-Based Cage Molecule," *J. Am. Chem. Soc.* **1998**, 120, 7111-7112.

J. Kim, C. Kim, R. G. Harrison, E. C. Wilkinson, L. Que, Jr., "Fe(TPA)-Catalyzed Alkane Hydroxylation Can Be a Metal-Based Oxidation," *J. Mol. Catal. A*, **1997**, 117, 83.

J. Kim, R. G. Harrison, C. Kim and L. Que, Jr., "Fe(TPA)-Catalyzed Alkane Hydroxylation. Metal-Based Oxidation vs Radical Chain Autoxidation," *J. Am. Chem. Soc.*, **1996**, 118, 4373.

B. K. Bennett, R. G. Harrison, T. G. Richmond, "Cobalticinium Fluoride: A Novel Source of "Naked" Fluoride Formed by Carbon-Fluorine Bond Activation in a Saturated Perfluorocarbon," *J. Am. Chem. Soc.*, **1994**, 116, 11165.

R. G. Harrison, T. G. Richmond, Commentary on "Room-Temperature C-F Bond Activation of Hexafluorobenzene by a Tailor-Made Pt(0) Intermediate, [(dtbpm)Pt(O)]" *CHEMTRACTS, Inorg. Chem.*, **1993**, 5, 115.

R. G. Harrison, T. G. Richmond, "Reductive Defluorination of Saturated Perfluorocarbons by Organometallic Nucleophiles," *J. Am. Chem. Soc.*, **1993**, 115, 5303.

R. G. Harrison, A. M. Arif, G. Wulfsberg, R. Lang, T. Ju, G. Kiss, C. D. Hoff, T. G. Richmond, "Crystallographic and Spectroscopic Assessment of Chelate Stabilized Aryl Halide Complexes at a Seven Coordinate d^4 Metal Centre," *J. Chem. Soc., Chem. Commun.*, **1992**, 18, 1374.