



S. H. Strauss

Steven H. Strauss

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Awards:	2002 Colorado State University Research Foundation Researcher of the Year; 2012–2014 Colorado State University College of Natural Sciences Professor Laureate
Current research interests:	Fluorinated molecules and anions; molecular electronics; lithium-ion batteries; catalysis; fullerenes; polycyclic aromatic hydrocarbons; polyhedral boranes and carboranes
Hobbies:	Watching and photographing birds, hiking, and bicycling

The author presented on this page has recently published his **10th article** in *Angewandte Chemie* in the last 10 years:

“C₂₀H₄(C₄F₈)₃: A Fluorine-Containing Annulated Corannulene that Is a Better Electron Acceptor Than C₆₀”: I. V. Kuvychko, C. Dubceac, S. H. M. Deng, X.-B. Wang, A. A. Granovsky, A. A. Popov, M. A. Petrukhina, S. H. Strauss, O. V. Boltalina, *Angew. Chem.* **2013**, 125, 7653–7656; *Angew. Chem. Int. Ed.* **2013**, 52, 7505–7508.

I would have liked to have discovered ... a new element.

The most exciting thing about my research is ... working closely with young co-workers and watching their transition from science students into scientists.

I lose track of time when ... I am organizing data and making figures and tables for a presentation or a manuscript.

The best advice I have ever been given is ... “The best way to have a good idea is to have a lot of ideas” (Linus Pauling).

The most amusing adventure in my career was ... giving a lecture, at the start of my career, at UC Berkeley in blue jeans and a plain white T shirt with hastily made transparencies the day after my luggage was stolen; it was not amusing at the time, but Neil Bartlett assured me that someday I would recall the experience fondly.

My favorite author is ... Daniel Dennett (specifically *Darwin’s Dangerous Idea* and *Breaking the Spell*).

My top three films of all time are ... *The Lion in Winter*, *Lawrence of Arabia*, and *Snatch* (“What do I know about diamonds?”).

The most significant scientific advance of the last 100 years has been ... access to real-time online searchable journals and databases.

If I could have dinner with three famous scientists from history, they would be ... Marie Curie, Charles Darwin, and Rachel Carson.

My favorite place on earth is ... southern Utah, with its five spectacular National Parks.

I chose chemistry as a career because ... 1) most scientists can only study the natural world but chemists can create the world that we study, and 2) new experiments in chemistry can be done on a daily basis, unlike sciences that require fieldwork (biology, geology, oceanography), painstaking sample preparation (paleontology, anatomy), or billion-dollar instrumentation (high-energy physics, astronomy). I like to have a new result to think about every day.

My best investment was ... my own research; frequently I forewent full summer salary in order to support my students.

My most exciting discovery to date has been ... a method for quantifying polyatomic anions in ppb concentrations in aqueous samples by ATR-FTIR spectroscopy with no sample pre-treatment.

What is the secret to publishing so many high-quality papers?

I don't think it is much of a secret. I teach my co-workers to make *close-to-final* figures and tables first; and clear, informative tables are as difficult to prepare as clear, informative figures, if not more so. Then, spread them out in front of you or tape them to a wall and let the best story that can be told using your results come together in your head *before writing anything*. This part alone can take days of concentrated effort. Only then should you begin to write, and you should write so that the reader will be nodding his or her head, completely understanding, if not agreeing with, what you have written. This requires crafting sentences and paragraphs one at a time, not going on until the previous one is polished and *close-to-final*. I have trouble reading and critiquing rough drafts, and I discourage co-workers and collaborators from giving me a draft before I will be able to nod my head, and smile, when I read it.

My 5 top papers:

1. "Latent Porosity in Potassium Dodecafluoro-*closo*-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": D. V. Peryshkov, A. A. Popov, S. H. Strauss, *J. Am. Chem. Soc.* **2010**, *132*, 13902–13913. The unusual behavior of $K_2B_{12}F_{12}$, which does not have a microporous structure but which undergoes hydration to $K_2(H_2O)_2B_{12}F_{12}$ and regeneration through dehydration in minutes at 25 °C (i.e., $K_2B_{12}F_{12}$ exhibits what we defined as "latent porosity").
2. "Synthesis and X-ray or NMR/DFT Structure Elucidation of Twenty-One New Trifluoromethyl Derivatives of Soluble Cage Isomers of C_{76} , C_{78} , C_{84} , and C_{90} ": I. E. Kareev, A. A. Popov, I. V. Kuvychko, N. B. Shustova, S. F. Lebedkin, V. P. Bubnov, O. P. Anderson, K. Seppelt, S. H. Strauss, O. V. Boltalina, *J. Am. Chem. Soc.* **2008**, *130*, 13471–13489. Our report about 21 new higher-fullerene(CF_3)_n compounds ($n=8, 10, 12, 14$) and the finding of a new paradigm for higher fullerene addition patterns.
3. "Electrochemical, Spectroscopic, and DFT Study of $C_{60}(CF_3)_n$ Frontier Orbitals ($n=2-18$): The Link between Double Bonds in Pentagons and Reduction Potentials": A. A. Popov, I. E. Kareev, N. B. Shustova, E. B. Stukalin, S. F. Lebedkin, K. Seppelt, S. H. Strauss,

How do you capture the attention of nonscientific audiences?

This is not easy. To quote a former student athlete, "When was the last time 70 000 people packed into the Orange Bowl Stadium to watch a chemistry experiment?" My style is to use humor mixed with self-deprecation as an antidote to the commonly held image of the aloof and self-centered scientist. For example, "Scientists are unpopular because, to be successful, they must have an overdeveloped sense of skepticism and the annoying habit of splitting hairs", and "Chemistry is everyone's least favorite subject; I don't like it either, but it's the only thing I'm good at". I also perform demonstrations that are, needless to say, safe, but I make the audience believe that there is a high probability that I will get singed and I usually ask someone in the first row to hold a fire extinguisher just in case I catch fire. Once I have their attention I can begin to inform, and not just entertain.

O. V. Boltalina, L. Dunsch, *J. Am. Chem. Soc.* **2007**, *129*, 11551–11568.

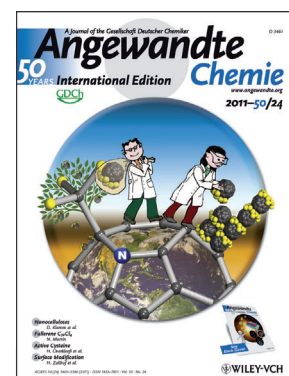
The electrochemical properties of 20 $C_{60}(CF_3)_n$ compounds (some reported here for the first time) and the finding that the addition pattern influences $E_{1/2}$ values much more than the number of CF_3 groups (e.g., $E_{1/2}$ values for six $C_{60}(CF_3)_{10}$ isomers varied by 0.5 V).

4. "Attenuated Total Reflectance FTIR Detection and Quantification of Low Concentrations of Aqueous Polyatomic Anions": G. N. Hebert, M. A. Odom, S. C. Bowman, S. H. Strauss, *Anal. Chem.* **2004**, *76*, 781–787.

An unprecedented infrared spectroscopic method for quantifying anionic pollutants such as perchlorate and perfluorooctylsulfonate at ppb concentrations in aqueous samples with no sample pretreatment and in only ca. 15 min.

5. "Nonclassical Metal Carbonyls: $[Ag(CO)]^+$ and $[Ag(CO)_2]^+$ ": P. K. Hurlburt, J. J. Rack, J. S. Luck, S. F. Dec, J. D. Webb, O. P. Anderson, S. H. Strauss, *J. Am. Chem. Soc.* **1994**, *116*, 10003–10014.

Our full paper about the structures and spectroscopic data for the first isolable, but extremely labile, Ag^I carbonyls, introducing the concept of nonclassical metal carbonyls.



The work of S. H. Strauss has been featured on the cover of *Angewandte Chemie*:

"Nitrogen Directs Multiple Radical Additions to the 9,9'-Bi-1-aza(C_{60} - I_h)-[5,6]fullerene: X-ray Structure of 6,9,12,15,18- $C_{59}N$ -(CF_3)₅": N. B. Shustova, I. V. Kuvychko, A. A. Popov, M. von Delius, L. Dunsch, O. P. Anderson, A. Hirsch, S. H. Strauss, O. V. Boltalina, *Angew. Chem.* **2011**, *123*, 5651–5654; *Angew. Chem. Int. Ed.* **2011**, *50*, 5537–5540.

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