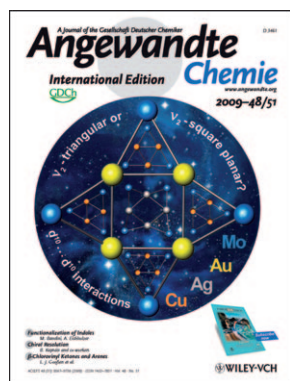




P. Braunstein

The author presented on this page has recently published his **10th article** since 2000 in *Angewandte Chemie* which has also been featured on the cover:

“Two-Dimensional Triangular and Square Heterometallic Clusters: Influence of the Closed-Shell d^{10} Electronic Configuration”: S. Sculfort, P. Croizat, A. Messaoudi, M. Bénard, M.-M. Rohmer, R. Welter, P. Braunstein, *Angew. Chem. Int. Ed.* **2009**, *48*, 9663–9667.



Pierre Braunstein

Date of birth:	October 4 th , 1947
Position:	Research Director with the Centre National de la Recherche Scientifique (CNRS)
Education:	1971 PhD with Jean Dehand, University Louis Pasteur, Strasbourg (France) Nov. 1971–Oct. 1972 Honorary Research Fellow with R. S. Nyholm, R. J. H. Clark, Department of Chemistry, University College London, London (UK) 1974 Doctorat des Sciences (State Doctorate), University Louis Pasteur, Strasbourg Nov. 1974–Oct. 1975 Humboldt Fellow with E. O. Fischer, Anorganisch-Chemisches Laboratorium der Technischen Universität München, Munich (Germany)
Professional associations:	Member of the French Academy of Sciences, the German Academy of Sciences Leopoldina, Academia Europaea, and the European Academy of Sciences; Corresponding member of the Academy of Sciences Saragossa, Spain; Fellow of the Royal Society of Chemistry, UK
Major awards since 2000:	2002 Otto-Warburg Award, Germany; 2003 Chini Memorial Lecture, Italy; 2003 Nyholm Medal and Lecture, UK; 2004 Grand Prix de l'Institut Français du Pétrole de l'Académie des Sciences, France; 2006 Honorary Professor, Chinese Academy of Sciences, Institute of Chemistry, Beijing; 2008 Descartes–Huygens Prize, Royal Netherlands Academy of Arts and Sciences and French Academy of Sciences
Current research interests:	Fundamental and applied molecular inorganic and organometallic chemistry; Creation of new chemical (metal–metal) bonds and new complex molecules; Elaboration of concepts rationalizing structure–reactivity relationships and their applications in homogeneous catalysis; Elaboration of nanomaterials from molecular precursors and their applications in heterogeneous catalysis; Synthesis and metal complexation of polytopic, functional ligands; New organic molecules with delocalized π systems (quinonoids); Chemistry of functional enolates and their metal complexes; Synthesis and reactivity of bimetallic silyl complexes; Molecular clusters (concepts, synthesis, structures, reactivity, catalysis)
Hobbies:	Classical music, seeing art exhibitions with the family (unfortunately not often enough!)

My favorite subjects at school ... ranged from Latin to sciences, with an increasing emphasis on the latter.

I chose chemistry as a career because ... I enjoyed the subject, its relevance to everyday life, and its versatility.

When I wake up I ... prepare breakfast and rush to the lab.

When I was eighteen I wanted to be ... a chemist because I had just started my first year in the Ecole Nationale Supérieure de Chimie de Mulhouse from which I graduated.

The most significant scientific advance of the last 100 years has been ... the atomic and molecular understanding of matter.

The biggest problem that scientists face is ... to generate public and political awareness and understanding (at least to some extent) of science and of its essential role.

The biggest challenge facing scientists is ... to continue to deliver solutions.

My favorite piece of research is ... Sorry, when you have many children, you love them all!

The most important future applications of my research are ... Any answer would be pretty conceited! If it has contributed to the advancement of our scientific knowledge, to the training of students and young scientists, and has inspired a few people, I would feel very pleased.

My first experiment was ... at home, as a teenager, playing with acids and bases from a chemistry kit, and as a PhD student, making the first complexes containing Pt–Mo and Pd–Mo bonds.

In a nutshell, my research involves ... the synthesis of new molecules and understanding their structures and properties.

The most exciting thing about my research is ... that it is never boring.

The secret of being a successful scientist is ... to follow your intuition, work hard, and remain enthusiastic about what you do.

The part of my job which I enjoy the most is ... to discuss unexpected results with my co-workers and colleagues.

How is chemistry research different now than it was at the beginning of your career?

It has become much more diversified and multidisciplinary. We take advantage of these opportunities in my own laboratory where the extent of topics covered could not have been anticipated when I entered the CNRS. Easy access to high-performance diffractometers, multinuclear NMR and mass spectrometers, for example, make possible investigations that were just not conceivable at the beginning of my career. The range and depth of competences needed require numerous national and international collaborations, which in turn generate a most fruitful exchange of ideas and knowledge and are culturally most gratifying.

Has your approach to chemistry research changed since the start of your career?

Yes and no. Yes because one always has to adapt to new scientific knowledge, technical developments, funding mechanisms, and so on, but at the same time our approach has not changed too much because we have remained a small team of craftsmen that have to rely mainly on their own imagination and skills. The need for scientists to adapt quickly triggers and provides unique opportunities for thematic and geographical mobility—an essential component in the career of a young scientist.

Has your approach to publishing your results changed since the start of your career?

Of course. The competition between journals for high-quality papers has led the authors to make more effort to communicate the importance and relevance of what they do to a broader readership. When I was a PhD student the “ranking” of journals was of very little concern to us and publishing a paper was in itself a great satisfaction!

What do you think the future holds for your field of research?

Synthetic chemistry will remain central to the development of our discipline. New applications, including at the frontiers with biology and physics, and new properties are intimately associated with the discovery and availability of new molecules. The combined use of metals and ligands that is

practiced in coordination and organometallic chemistry provides excellent opportunities to broaden one's scientific culture. The mastering of synthetic challenges combined with the use of modern instrumentation offers an infinite playground and unique opportunities.

Have you changed the main focus of your research throughout your career and if so why?

Of course. New research areas have emerged, often by serendipity, which we considered to be interesting to explore and develop. Other subjects have remained of considerable interest since the beginning, and our national research structure and funding system have fortunately allowed us to maintain curiosity-driven activities, which in turn have often generated unexpected applications and developments.

What has been your biggest influence or motivation?

I was fortunate enough to be exposed, at a very early stage of my career, to the international context of research and to experience the enthusiasm and motivation of major scientists. This has had a significant influence on my desire to promote and develop international collaborations and exchanges for the benefit of chemistry and of the people, particularly of the younger scientists.

What advice would you give to up-and-coming scientists?

Take advantage of all the opportunities you have to attend seminars and travel to conferences to become inspired by what more established scientists do, talk to them, and identify what you would like to do. Then work hard, delineate your playground, and do not listen too much to fashion, because sooner or later, fashion will be out of fashion! Think long-term, including in ethical issues, because eventually thermodynamics wins over kinetics!

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

There is no secret! Just work hard with some imagination and inspiration and be lucky to have talented co-workers.

My 5 top papers:

1. "Selective Carbonylation of Nitrobenzene over a Mixed Palladium–Molybdenum Cluster-Derived Catalyst": P. Braunstein, R. Bender, J. Kervennal, *Organometallics* **1982**, *1*, 1236–1238.

This was the first example of the use of molecular-cluster-derived bimetallic nanoparticles in heterogeneous catalysis, at a time when thermally "decomposing" a "nice" molecule to generate metal particles was not very popular! It also provided evidence for the role of each metal in an overall transformation that made use of carbon monoxide instead of phosgene to produce organic isocyanates. This field of bimetallic catalysis developed considerably, as evidenced by the review "Heterometallic Clusters in Catalysis": P. Braunstein, J. Rosé in *Metal Clusters in Chemistry*, Vol. 2 (Eds.: P. Braunstein, L. A. Oro, P. R. Raithby), Wiley-VCH, Weinheim, **1999**, pp. 616–677.

2. "Novel Bonding Mode for a Cyanometalate Ligand: Synthesis and Crystal Structure of the Mn_4Pd_4 Cluster $[(\text{OC})\text{Pd}(\mu\text{-NC})\text{Mn}(\eta\text{-C}_5\text{H}_4\text{Me})(\text{CO})_2]_4$ Containing an Orthogonal Arrangement of Helical Units": P. Braunstein, B. Oswald, A. Tiripicchio, M. Tiripicchio Camellini, *Angew. Chem.* **1990**, *102*, 1206–1209; *Angew. Chem. Int. Ed. Engl.* **1990**, *29*, 1140.

As part of a comparative study on the reactivity and bonding properties of isoelectronic carbonylmetalates used to prepare mixed-metal clusters, we obtained in quantitative yield this unprecedented structure of S_4 symmetry formed by eight metal centers linked through direct metal–metal bonds and bridging cyanide ligands. This unexpected and aesthetically most pleasing structure was also that of the first molecular cyanometalate cage.

3. "Hemilability of Hybrid Ligands and the Coordination Chemistry of Oxazoline-Based Systems": P. Braunstein, F. Naud, *Angew. Chem.* **2001**, *113*, 702–722; *Angew. Chem. Int. Ed.* **2001**, *40*, 680–699.

This review helped to convey the importance of the

hemilability concept in molecular chemistry and provided a useful classification of the various situations encountered. It also placed our own work in perspective, including the use of unsymmetrical P,N-type ligands to generate stereoelectronic differentiation in the metal coordination sphere, the isolation of stable monohapto-allyl Pd^{II} complexes, and the unexpected ability of alkoxysilyl ligands to form dynamic bridges between two metal centers.

4. "Catalytic Ethylene Dimerization and Oligomerization: Recent Developments with Nickel Complexes Containing P,N-Chelating Ligands": F. Speiser, P. Braunstein, L. Saussine, *Acc. Chem. Res.* **2005**, *38*, 784–793.

This paper showed the diversity of structures that Ni^{II} complexes containing a chelating P,N ligand can have and their relevance to an important catalytic reaction. It also illustrated a very fruitful collaboration that started in the early 1990s with the Homogeneous Catalysis Laboratory of the French Institute of Petroleum (IFP), directed at that time by Y. Chauvin and subsequently by Hélène Olivier-Bourbigou.

5. "Bonding and Organic and Inorganic Reactivity of Metal-Coordinated Phosphinoenolates and Related Functional Phosphine-Derived Anions": P. Braunstein, *Chem. Rev.* **2006**, *106*, 134–159.

This review highlighted the importance of functional phosphine and related ligands in coordination and organometallic chemistry, and their relevance to a number of catalytic reactions, including ones on the industrial scale such as the Shell Higher Olefin Process. We started our own investigations in the field of functional phosphine ligands in the late 1970s and shortly after discovered a Pd^{II} complex able to reversibly bind CO_2 at room temperature and pressure, which was relevant to the catalytic telomerization of butadiene and CO_2 to produce lactones.

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