# BIOGRAPHICAL SKETCH

**Sara Aldabe Bilmes**

born September 3rd 1954 at Buenos Aires, Argentina.
Divorced, 2 children: Irene (33) and Andrés (35) Bilmes

**Address**:

Universidad de Buenos Aires (**UBA**), Facultad de Ciencias Exactas y Naturales (**FCEN**),
Departamento de Química Inorgánica, Analítica y Química-física (**DQIAQF**)
Instituto de Quimica-física de Materiales, medio Ambiente y Energía (**INQUIMAE**)-
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**Present Position**

- Full Professor Facultad de Ciencias Exactas y Naturales. Universidad de Buenos Aires (FCEN-UBA).
- Superior Researcher National Research Council of Argentina (CONICET)
- Director DQIAQF, (FCEN-UBA)

**Studies**

FCEN-UBA. Graduate in Chemistry. 1977
FCEN-UBA. Doctor in Chemistry. 1982.
Université de Poitiers, Electrocatalysis, 1982
Düsseldorf University. Germany. Spectroelectrochemistry. 1987-1989.

**Scientific interests**

Sol gel processes
Optical properties of nanostructures
Mesoporous oxides
Photocatalysis
Materials with biological activity

**Scientific production**

- Original papers in peer-reviewed journals: 73
- Book chapters: 7
- Proceeding (extended articles) 6
- 1800 citations; h index = 25 (Google Scholar)
- More than 50 invited presentations in scientific institutes, national and international meetings

***Publications since 2007***

43 *Plant cell proliferation inside an inorganic host;* M. Perullini, M. M. Rivero, M. Jobbagy, A Mentaberry,, S. A. Bilmes ; J. Biotechnol 127, 2007, 542-548

44 *Mesoporous Anatase TiO2 Films: Use of Ti K XANES for the Quantification of the Nanocrystalline Character and Substrate Effects in the Photocatalysis Behavio*r; P C. Angelome, L. Andrini, M. E. Calvo, F. Requejo, S.A. Bilmes, and . J. A. A. Soler-Illia, J. Phys. Chem. C.; 2007; 111; 10886-10893

45 *Mesoporous Hybrid Thin Films: Building Blocks for Complex Materials with Spatial Organization*, G. J Soler-Illia, P. Angelomé, M. C. Fuertes, A. Wolosiuk, S. A.Bilmes, Francisco J.López-Alcaraz, and H. Míguez; in *Organic/Inorganic Hybrid Materials—2007*, (Mater. Res. Soc. Symp. Proc. Volume 1007, Warrendale, PA, 2007), -S05-01

46 *Plant Cell Proliferation Inside a Silica Matrix;* M. Perullini, M. M. Rivero, M. Jobbagy, A Mentaberry,, S. A. Bilmes ; Proc 9th International Symp. on Biomineralization: from Paleontology to Materials Science; ed JL Arias, MS Fernández; Editorial Universitaria, 2007, pgs 369-376

47 *Optimizing Silica Encapsulation of Living Cells: In Situ Evaluation of Cellular Stress;* M. Perullini, M. Jobbagy, M. Bermudez Moretti, S. Correa Garcıa, S. A. Bilmes; Chem. Mat 2008; 20, 3015-21

48 *Silica-Alginate-Fungi Biocomposites for remediation of polluted water.* M. Perullini, M. Jobbágy, N. Mouso, F. Forchiassin, S. A. Bilmes, J. Mater. Chem., 2010, 20, 6479 – 6483. Highlighted in RSC Chemcal technology, 2010

49 *A comprehensive study of the influence of the stoichiometry on the physical properties of TiOx films prepared by ion beam deposition* M. C. Marchi, S. A. Bilmes, C.T.M. Ribeiro, E. A. Ochoa, M. Kleinke, and F. Alvarez, J. Applied Physics, 108 2010 64912

50 *Functional nanocomposites based on the infusion or in situ generation of nanoparticles into amphiphilic epoxy gels.* A. Ledo-Suárez, J. Puig, I. A. Zucchi, C. E. Hoppe, M. L. Gómez, R. Zysler, C. Ramos, M. C. Marchi, S. A. Bilmes, M. Lazzari, M. A. López Quintela, R. J. J. Williams, J. Mater. Chem. 20 (2010) 10135–10145.

51 *CeO2 Nanoparticles for the Protection of Photosynthetic Organisms Immobilized in Silica Gels* C. Sicard, M. Perullini, Th. Coradin, R. Brayner, J. Livage, M. Jobbágy, S.A. Bilmes, Chem. Mat. 23 1374-1378, 2011.

52 *Improving bacteria viability in metal oxide hosts via an alginate-based hybrid approach;* M. Perullini, M. Amoura, M. Jobbágy, C. Roux, J. Livage, T. Coradin, S. A. Bilmes; J. Mat. Chem. A 2011, 21, 8026-8031

53 *Effect of synthesis conditions on the microstructure of TEOS derived silica hydrogels synthesized by the alcohol-free sol-gel route*. M. Perullini, M. Jobbágy, S. A. Bilmes, I. L. Torriani, R. Candal; J. Sol gel sci Tech 2011, 59, 174-180

54 *Improving silica matrices for encapsulation of Escherichia coli using osmoprotectors*, M. Perullini, M. Amoura, C. Roux, Th. Coradin, J. Livage, M.L. Japas, M. Jobbágy, S.A. Bilmes; J. Mater. Chem., 2011, 21, 4546-4552

55 *Development of a Biosensor for Environmental Monitoring Based on Microalgae Immobilized in Silica Hydrogels* Ferro, Y.; Perullini, M.; Jobbagy, M.; Bilmes, S.A.; Durrieu, C.. Sensors 2012, 12, 16879-16891

56 *One-step hydrothermal synthesis and photocatalytic performance of ZnWO4/Bi2WO6 composite photocatalysts for efficient degradation of acetaldehyde under UV light irradiation* M. Hojamberdiev, K.-i. Katsumata, K. Morita, S.A. Bilmes, N. Matsushita, K. Okada, Applied Catalysis A, General (2013), 457, 12-20

57 *Surface structure and reactivity study of phosphotungstic acid-nitrogenated ormosils* E. P. Ferreira-Neto, F. L. S. de Carvalho, S. Ullah, V. C. Zoldan, A. A. Pasa, A. Lopes de Souza, L. C. Battirola, P. Rudolf, S. Aldabe Bilmes, U. P. Rodrigues-Filho. J. Sol Gel Sci. Tech, 2013, 66, 363-371

58 *Photoactive Layer-by-Layer films of Cellulose Phosphate and Titanium dioxide*; S. Ullah,; J. J. S Acuña, ; A. A Pasa,; S. A Bilmes; Maria E Vela; G. Benitez,; U. Pereira Rodrigues-Filho, Applied Surface Science, 2013, 277, 111-120

59 The role of seeding in the morphology and wettability of ZnO nanorods films on different substrates. J. Rodriguez, D. Onna, L. Sanchez, M.C. Marchi, R. Candal, S. Ponce, S.A. Bilmes Applied Surface Science (2013), 279, 197 - 203

60 *Sol-gel silica platforms for microalgae-based optical biosensors* M. Perullini, Y. Ferro, C. Durrieu, M. Jobbágy, S. A. Bilmes; J. Biotechnology, 2014, 179, 65-70

61 *Silver Nanoparticle-Mesoporous Oxide Nanocomposite Thin Films: a Platform for Spatially*

*Homogeneous SERS-Active Substrates with Enhanced Stability.* A. Wolosiuk, N. G. Tognalli, E. D. Martinez, M. Granada, M. C. Fuertes, H. E. Troiani, S. A. Bilmes, A. Fainstein, G. J. A. A. Soler-Illia ACS Applied Materials & Interfaces, 2014, 6, 5263-5272

62 *New Method for the Simultaneous determination of Diffusion and Adsorption of dyes in Silica Hydrogels.* M. Perullni, M. Jobbagy, M.L. Japas, S.A. Bilmes; J. Colloid and Interface Sci. 2014, 425, 91-95

63 *Ethylenediamine (EDA) - assisted hydrothermal synthesis of nitrogen-doped Bi2WO6 powders* ; G. Zhu, J. Liang, M. Hojamberdiev, S.A. Bilmes, X. Wei, P. Liu, J. Zhou, Materials Lett. 2014, 122, 216-219

64 *Rhodamine B doped silica encapsulation matrices for the protection of photosynthetic organisms;* M. Perullini, C. Durrieu, M.Jobbágy, S. A. Bilmes ; J. Biotech. 2014, 184, 94-99

65 *Co-encapsulation of Daphnia magna and microalgae in silica matrices, a stepping stone toward a portable microcosm;* M. Perullini, F. Orias, C. Durrieu, M. Jobbágy, S.A. Bilmes ; Biotechnology Reports 4 (2014) 147–150

66 *Influence of the spray pyrolysis seeding and growth parameters on the structure and optical properties of ZnO nanorod arrays,* J. Rodríguez, G. Feuillet, F. Donatini, D. Onna, L. Sanchez, R. Candal, M. C. Marchi, S. A. Bilmes, F. Chandezon, , Materials Chemistry and Physics, 151, (2015) 378-384.

67 *Silica@ proton-alginate microreactors: a versatile platform for cell encapsulation* Spedalieri, C., Sicard, C., Perullini, M., Brayner, R., Coradin, T., Livage, J., Bilmes, S.A., Jobbágy, M. (2015). *Journal of Materials Chemistry B*. (2015),**3**, 3189-3194

68 *Enhanced photocatalytic properties of core@shell $SiO_2$@$TiO_2$ nanoparticles;* Sajjad Ullah, Elias P. Ferreira-Neto, André A. Pasa, Carlos C.J. Alcântara, José J.S. Acuña, Sara A. Bilmes, Maria L.Martínez Ricci, Richard Landers, Taina Zampieri Fermino, Ubirajara P. Rodrigues-Filho ; *Applied Catalysis B, 179 (2015) 333-343.*

69 *Alginate/porous silica matrices for the encapsulation of living organisms: tunable properties for biosensors, modular bioreactors, and bioremediation devices*; M. Perullini, M. Calcabrini, M. Jobbagy, S.A. Bilmes, Mesoporous Biomaterials, 2 (2015) 3-12

70 *Thermodecomposition synthesis of porous β-$Bi_2O_3$/$Bi_2O_2CO_3$heterostructured photocatalysts with improved visible light photocatalytic activity*. Gangqiang Zhu, Yongbao Liu, Mirabbos Hojamberdiev, Juan li Han, Juan Rodríguez, Sara A. Bilmes and Peng Liu; New J. Chem. (2015) 2015,**39**, 9557-9568

71 *Feasibility of using a translucid inorganic hydrogel to build a biosensor using immobilized algal cells* C. Durrieu, Y. Ferro, M. Perullini, M. Jobbagy, S.A. Bilmes; ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 23, 2016, 9-13

72 *Microstructure and transport properties of biocompatible silica hydrogels.* A.M. Perullini, N. Levinson, M. Jobbagy, S.A. Bilmes; J. Sol-Gel Sci Tech, 77, 2016, 437;

73 *Microorganism mediated biosynthesis of metal chalcogenides; a powerful tool to transform toxic effluents into functional nanomaterials.* P. Vena, M. Jobbagy, S.A. Bilmes, Science of the Total Environment, 565, 2016, 804-810

**Teaching and popularization production**

Books *for students and teachers*

- *El desafío de enseñar ciencias naturales*, Laura Fumagalli, Editorial Troquel, 1993
- *Química I, fundamentos*. S.Aldabe, P. Aramendía, L. Lacreu. Libro para alumnos de Polimodal. Editorial Colihue (1999) 454 pags *Tabla periódica de los elementos*. S.Aldabe, P. Aramendía, L. Lacreu. Editorial Colihue (2000)
- *Química II, química en acción*. S.Aldabe, P. Aramendía, C. Bonazzola, L. Lacreu. Libro para alumnos de Polimodal orientado a ciencias naturales y tecnología Editorial Colihue (2005)

- *Construyendo Con Átomos y Moléculas (Eudeba, Colección Ciencia Joven n°17)* integrante del equipo INDIGO

**Technological transfer activities**

Rizobacter SA. Hybrid matrices for the incorporation of rizobacteria to seeds

Fabriquimica SA: encapsulation of molecules in silica matrices for cosmetics

FASINPAT: self-cleaning tiles

**Science related management**

Member of the Board International Sol Gel Society (2011-2017)

Member of Nanoandes Network (since 2011)

Member of Advisory Board Fundación Argentina de Nanotecnología (since 2013)

Director DQIAQF (2002-2005; 2015-2017)

Participation in national and international Selection Committees

Reviewer of indexed journals