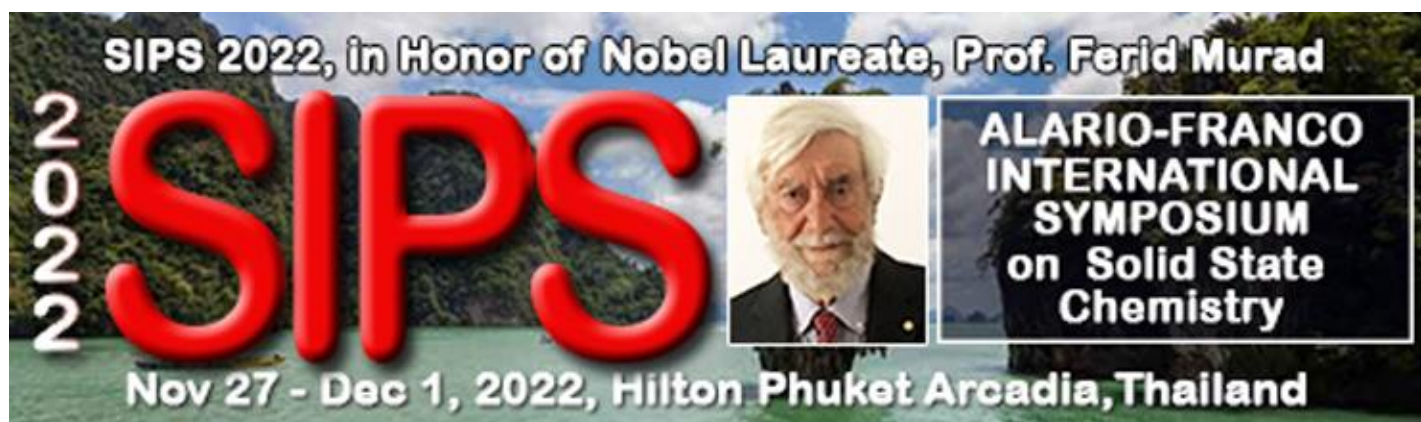


Intl. Symposium on Solid State Chemistry for Applications and Sustainable Development



Bio. CV. Publications

This is a major symposium in honor of the distinguished work and lifetime achievements of Prof. Miguel -Angel Alario-Franco, a renowned figure in the field of Solid-State Chemistry and Materials Science.

Curriculum Vitae Madrid (1 August 2022)

Prof. Dr. Miguel Ángel Alario y Franco (Madrid 1942).

DSc.Chemistry (Universidad Complutense Madrid-UCM) (1970).

University Positions

Post-doc: London (Brunel Univ./Prof. K.S.W.Sing), Wales (Univ. of Aberystwyth/Prof. SIR John M. Thomas)), Italy (ICTP Trieste: F. García Moliner): **3years.**

Research Scientist, Institute of Materials CSIC Madrid (1973-6).

Professor of Inorganic Solid-State Chemistry (*Facultad Químicas; UCM 1976-*).

Dean of Chemistry (1986-1994).

Visiting Professor/ Scholar/Professeur Associé/ Directeur de Recherche:

Cambridge (UK) Sir John.M.Thomas; Grenoble-(F) Profs. F.Bertaut, J.-C Joubert &

M.Marezio; Berkeley (UCB-USA) Prof. Angy Stacy; Bahía Blanca (Argentina) Prof. Bazán; San Diego (UCSD-USA) Prof. Ivan Schuller: **7 years in all.**

America Chair, Spanish Institute – 2 Months in México- (UNAM)-1996.

Emeritus Professor UCM (2012-2015). U. San Pablo/CEU- (2013-4).

Honorary Professor U. Carlos III (2013-4).

Visiting Scientist: Institute of Integrated Cell-Materials, Kyoto U (2w/y 2011-13).

Honorific Professor UCM (2016-).

Member of Colegio Libre de Eméritos de España (2015-)

Guest Professor, Southeast Univ. Nanjing, China (2021)

Academies' Membership

Full member (1991-) and **President** (IX-2009-IX-2011) *Real Academia de Ciencias Exactas, Físicas y Naturales de España.*

Founder (1985) & President (1985-1998) Solid State Chemistry group, Spanish Royal Society of Chemistry.

Honorary member: Materials Research Society of India (1992-).

Corresponding member: Academy of Sciences of República Argentina (2008-),

Honorary Academician of the Academy of Sciences of Colombia (2010-).

Honorary Fellow of the University of Wales, Aberystwyth (2015-).

Full Member, European Academy of Sciences (**EurAsC**) (2018-)

Some Scientific accomplishments

Pioneer, at the international level, in the early seventies, in the development of *Solid State Chemistry and Materials Science* as a *research activity* in the

Condensed Matter field and as an *academic discipline* non-existing in Spain -and many other places at the time.

Innovator in the use of Electron Microscopy & Electron Diffraction in the Chemistry of Solids.

Founder (1974) & **Director** (1974- 2017) of the **Solid-State Chemistry group** in the Faculty of Chemistry of UCM, (more than *125 visiting scientists*; -40% foreigners in periods of two weeks to four years).

Founder of Electron Microscopy group, Institute Elhuyar, CSIC (1976) (later ICMM).

Founder (with A. M Municio y R. G Amado) and **Scientific Director** (1987-1992): “Luis Bru” **Electron Microscopy Center**, UCM. Later National Center.

Introducer of Electron Microscopy in 3 French laboratories: Cristalographie-CNRS (C. Chaillout) Grenoble 1983; INPolytechnique Grenoble (M. Labeau) 1986 & LCS Bordeaux (J. -C. Grenier) 1990.

Founder (1996) & **director** (1996-2016) of Complutense Laboratory for High Pressure/ <http://webs.ucm.es/info/labcoap/index.htm>.

Founder (with E. Morán) of the “*Solid State Electrochemistry Lab*” in the Faculty of Chemistry (UCM).

Main Research Lines & Key Words

Surface Chemistry: Structural & textural properties of Solids (1965-1980)

Solid State Chemistry (1971-onwards): **Synthesis**, structural and *micro*-structural characterization of non-molecular solids. Composition-Structure-Microstructure-Defects-Relations. Extended defects and non-stoichiometry. Diffusion in solids. Electric, magnetic, superconducting & thermal properties of solids. Hydrothermal, High Pressure & High Oxygen Pressure Synthesis of Solids.

Techniques mastered: X-ray, neutron & electron diffraction, XPS; TEM, HREM (including HAADF-STEM & ABF-STEM), EDX, EELS.

Materials studied (according to FIZ/NIST Inorganic Crystal Structure Data Base, **more than one hundred and fifty five novel materials prepared**): Catalysts, ionic conductors, NTE Materials, materials for fuel cell: electrodes & electrolytes, materials for batteries, electronic conductors, ferroelectric, ferromagnetic, multifunctional & **especially HTSC** (*High Temperature Superconductors*); Mixed ionic & superconducting materials.

SEE APPENDIX I: WORK ON HIGH TEMPERATURE SUPERCONDUCTORS

Scientific Committees

Member (since 1984-) International Committee on the Reactivity of Solids (1992).

President of the *International Symposium on the Reactivity of Solids* (Madrid 1992).

Chair of the Gordon Research Conference in *Solid State Chemistry* (*Oxford-UK*) 2003. **Co-chair** of the *Solid-State Chemistry of Inorganic Materials Symposium* in the MRS Fall Meeting -. Boston in 2002.

Co-chair Non-Molecular Solids Symposium in the International Materials Research Congress, Cancún, México (2006-10 & 2012-; 2014; 2017)

Member International Advisory Panel in Superconductivity (EU) (1988-2000)

Member Gordon Research Conferences on Solid State Chemistry Panel (EU 2002-2008; USA 1999-2022).

Founder (1985) & **President** (1985-98) Solid State Chemistry Group of Spanish Royal Society of Chemistry.

Spanish representative in the "*High temperature and Solid-State Chemistry committee*" of IUPAC. (1987-1992).

Diploma of Tel-Aviv University. for cooperation with UCM ((1989).

Member of the Academic Council, *Real Colegio Complutense* at Harvard University (1990-2016).

Member of Scientific Committee, Institute of Materials IN Polytechnique de Grenoble (1996-9).

Scientific Auditor of *Instituto de Materiales UNAM* –Mexico (1997-2000)

Member of Direction Board of Laboratoire Chimie Solide CNRS Amiens (1993-5)

Member of Int. Committee (1988-2008) /lecturer: HTSC- M²S Congress:

Interlaken 1988, Grenoble 1994, Peking (& Session Chair) (1997), Houston 2000.

Rio de Janeiro (2003) Stuttgart (2006).

Promoter & Member of Scientific Committee of First Hispano-French Encounter for Inorganic Materials (1986)

Mentoring

Director/Codirector of 28 Doctoral Thesis and over 70 Master Thesis. **Among his** past Ph.D. & graduate students there are **14 University Professors (5 of them in Universities outside Madrid); 3 Associated Professors, 1 *Directeur de Recherche* & 1 Chercheur (CNRS) and several other distinguished scientists in Spain, France, Argentina and Mexico.**

Tutor for Two Fulbright Fellowships (1 in 2003 from Cornell Univ. & 1 in 2015 Princeton University students).

Member of the Jury for three *habilitations* and half a dozen thesis in France **and President of two others:** one in France –Bordeaux- and the other in Russia— Lomonosov University- and yet another one in Colombia –Universidad del Valle.

Founder & Director of the first (in Spain) **Master course on Science and Technology of Advanced Materials.** (Universidad Complutense: 1987-1989).

Member of the Jury in 6 research Prizes in Spain: Príncipe de Asturias, Dupont, Solvay, Ramón y Cajal, Rey Juan Carlos & Gran Canaria in more than 15 occasions. More recently in Argentina and Vietnam.

University Lecturing in Solid State Inorganic Chemistry & Superconductivity

Besides the usual Inorganic Chemistry teaching for more than 40 years, it is worth mentioning the setting up of a **specific course in Solid State Chemistry of Non-**

Molecular Solids, non-existing in the Spanish curricula in the seventies

(See APPENDIX II).

Now it is taught in practically all Faculties of Chemistry and some Engineering Schools in Spain (often by his past students).

Also, along the years (since 1987), a post-graduate course in Superconductivity –with special reference to HTSC Materials- has been taught by him based in his book on *Superconductivity* mentioned below.

Invited Lectures & Conferences

Invited lecturer in numerous international institutions, Congresses, Universities and Research centres **in more than 20 Countries.**

Among them:

Speaker & Co-Chair at the Opening session & 7 communications:

1st European Workshop on High Tc Materials, Génoa (ITALIA), 1987.

Invited plenary lecturer: MRS spring Meeting: HTSC Materials, San Diego (1989)

Speaker at HTSC-M²S: Interlaken (SUIZA) 1988, Grenoble (1994), Pekín ; (1997), Houston 2000..

Speaker at Reuniao Hispano-Portuguesa de Adsorcao. Lisboa (PORTUGAL), 1980.

Speaker at European Symposium on Thermal Analysis. Aberdeen (UK), 1981.

Speaker at Symposium on the gas-solid interface. C.N.R.S., Aix-en-Provence (France), 1981:

Speaker 2nd European Conference on Solid State Chemistry, Eindhoven (Netherlands), 1982.

Speaker at Echem Conference on H.R. Electron Microscopy. Estocolmo (Sweden), 1983.

Speaker at 3rd European Symposium on Thermal Analysis. Interlaken

(Switzerland), 1984.

Speaker at 4th International FERRITES Conference. San Francisco, California (USA), 1984.

Speaker at EMAG Conference, Newcastle (UK), 1985.

Speaker at III European Conference on Solid State Chemistry, Regensburg, Germany 1986.

Invited lecturer at the Gordon Research Conferences in *Solid State Chemistry* held in Plymouth (NH-USA) in 1990 *and also, 21 years later*, in 2012, in London (NH-USA).

Invited lecturer at Gordon Research Conference in Superconductivity, Ventura California 1991.

Lecturer in Atmospheric Chemistry & Climate Change Summer Courses (1996-2001) *Real Colegio Complutense* at Harvard University.

Co-chair & speaker: Solid State Chemistry of Inorganic Materials Symposium. MRS Fall Meeting, Boston 2002.

Speaker & Chair, Joint Session of the Symposia: "Solid State Chemistry of Inorganic Materials Symposium" & "Solid State Ionics Symposium" Fall Meeting. Materials Research Society USA (Boston, 2008).

Co-Chair &/or Speaker of the *Non-Molecular Solids symposium* in the International Materials Research Congress (USA-MRS +Mex.-MRS: Cancun, México (2006-2018).

Invited as Key Note Speaker at the Int. Conf. on Recent Trends in Advanced Materials (ICRAM 2012 Vellore-India) Feb 2012.

Speaker at the "*New trends in SS Chemistry: from oxide to mixed anion compounds*", Toyota Museum of Technology, Kyoto (November 2017) & **Banquet lecture** at same.

Speaker at "*SS Chemistry Workshop-Functional materials*": Ningbo. China May 2018.

Speaker & Chair. Areces Symposium “Superconductivity and Pressure: A fruitful relation on the road to Room Temperature Superconductivity. Madrid (2018)

Prizes and awards

Prize for young scientists, Royal Society of Physics and Chem. of Spain 1973.

Research Prize, Royal Academy of Sciences of Spain, **1984.**

Research Prize, Academy of Sciences of Granada **1990.**

Rey Jaime, I Prize on Basic Research in 1991.

Medal of Honour of the Spanish Royal Society of Chemistry **1996**

Golden Epsilon of the Spanish Society of Ceramics **2003.**

México Prize on Science and Technology 2009.

Senior Research Award of the Franco-Spanish Solid-State Chemistry and Physics conference **2010.**

Miguel Catalán Prize to a “*scientific career*,” Madrid Autonomous Community,” **2010.**

Diamond & Gold Medal of Madrid Association of Chemists & Chemical Engineering (**2015**).

Summary of the scientific career and notice of the establishment of the laboratories required for its development

Introduction

The work carried out in the fifty-seven years since the end of the Chemistry degree (1965) began with the exciting task of the Master Thesis followed by the Doctoral Thesis. Both were directed by Professor Dr. Andrés Mata-Arjona, who, in addition to providing me with the work topic and the ideas to develop it, induced my experimental training, promoting the construction of the equipment that, after the synthesis of hydrated aluminium phosphate-type materials, allowed the thermal treatments of the samples in vacuum and the measurement of their porous texture. These two pieces of equipment, *Figure 1*, which I did personally built practically by

myself and an expert glass blower, essentially by hand and starting practically from scratch, later served, for more than twenty years, to carry out several other master and doctoral theses in my own group and even in other research groups.

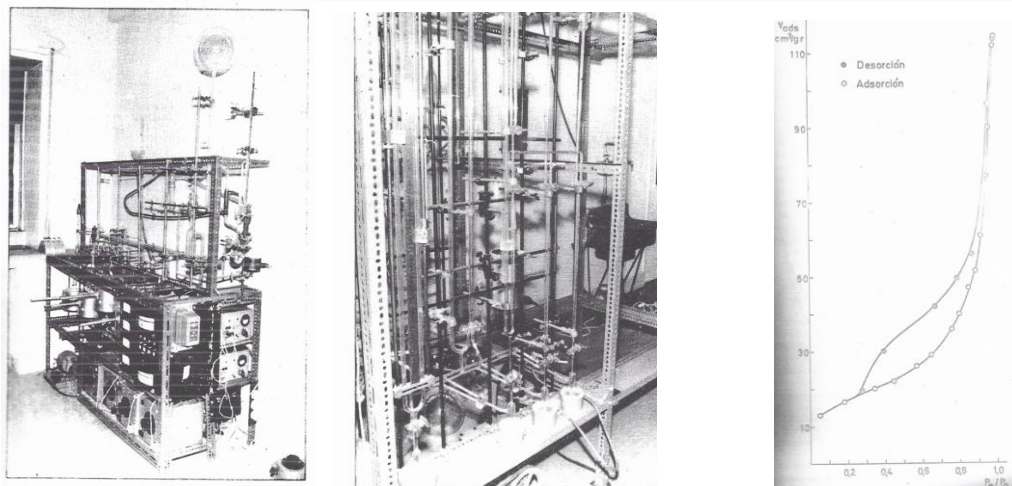


Figure 1 Home-made equipment for: left, the thermal treatment of the samples under vacuum & centre, the measurement of adsorption isotherms at liquid nitrogen temperatures; right, an adsorption-desorption isotherm (1966-1970).

Moreover, the first one was later “converted” to a hydrothermal synthesis equipment in the High-Pressure Laboratory that we set up years later, (see below).

Subsequently, the postdoctoral period in Great Britain took me, using a metaphorical language, to the "inside" of the solid, of which, it can be said continuing the metaphor, until then we had only covered the surface and learned something about the dehydration processes of the gels, and therefore their reactivity. Reactivity that, on the other hand, has also been a constant in our work. Indeed, the Reactivity of Solids was the theme of the first International Congress in which I presented an extensive communication, it was also the theme of the first International Committee for which I was elected - and I continue to be a member - and it was also the theme of the First International Congress, an important event that I organized and presided over, in Madrid, in 1992.

My "discovery" that the solid also *have* a Chemistry -I mean a *specific Chemistry*, largely different from that of liquids and gases, today called Solid-State Chemistry- that was by then, in the early seventies, an incipient Chemistry, has marked the rest of my career until now.

Upon my return to the Department of Inorganic Chemistry of the Complutense University of Madrid, which in its geographical, managerial and

thematic aspects coincided with the Elhuyar Institute of the Higher Council for Scientific Research (CSIC), I set myself the task of starting the implementation and later the development in Spain, but not only in it, of that Solid State Chemistry. And along this path I have contributed, modestly, but in a very significant way to the growth of the aforementioned discipline at an international level. To this end, the work carried out since 1973 was developed in two fronts:

On the one hand, with the creation of a research group in which several doctoral theses (more than 25) were carried out and from which many other disciples emerged who immediately afterwards went to important foreign research centres, where that still relatively new Chemistry that we have defined as "the Chemistry that solids present as such, different from that of liquids and gases" was being cultivated. The subsequent return of all of them to the group made this the most important in Spain in these disciplines and have achieved notorious international relevance. Subsequently, many of the graduates established themselves on their own in different universities and research centres. The seed, then, bore fruit widely.

On the other hand, the development of a new (in 1973) academic discipline, Solid State Chemistry, as a university subject in its theoretical and practical aspects, hitherto unknown in Spain, even in most of Europe, and still not very frequent in the rest of the world (i), allowed disseminating an original and growing teaching program, to which different parcels have been added on the borders of Solid-State Physics, Mineralogy, Crystallography..., to lead to many of the basic aspects of Materials Science. This subject exists today in the curricula of most degrees in Chemical Sciences, Engineering and Materials Science, in Spain and abroad, largely due to the influence that our group has had on its initial development in Spain. The Program for this subject, in force at the Faculty of Chemical Sciences of the Complutense University and several other Spanish universities, is included in section II of this REPORT and reveals the evident synergy between the teaching and research aspects of our scientific career.

Research Lines developed in our Laboratory: Solid State Chemistry and Materials Science

1) Synthesis of multiple oxides by conventional methods and especially at High Pressure and High Temperature, including the Creation of the **Complutense High Pressure Laboratory: LABCOAP** (<https://www.ucm.es/labcoap/>)

2) Use of Structural and Micro-structural Characterization Techniques (High Resolution Electron Microscopy, Electron Diffraction, EDX and EELS).

(Including the creation and start-up of the "Luis Bru" **Electron Microscopy Center of the Complutense University (in 1986)** and, previously, the **Electron Microscopy section of the Elhuyar Institute of the CSIC**, (in 1975).

3) Establishment of a **Laboratory of Electrochemistry in the Solid State (1990)** for processes of Insertion, Electrodeposition, Lithium Ionic Conductivity. Electrochemical Oxidation-Reduction processes in a liquid medium, using materials in the electrodes to modify their structure and properties.

4) Study of very diverse electrical, electronic, magnetic functional materials..., including multiple oxides of different metallic elements, by means of their structural, micro-structural characterization (X-ray diffraction, electrons, neutrons, high-resolution electron microscopy, and techniques auxiliaries such as EELS, XPS, STEM and SBM) and the measurement of their electrical, magnetic, specific heat properties, etc.

5) Finally, and above all, we highlight the *establishment and development of the first line of research in Spain on High Temperature Superconducting Materials (1986-)*, which allowed us to hold the T_c record in a couple of historical moments in the study of *cuprates* and to be accepting in our laboratory researchers from several countries: France, Great Britain, USA, Italy... and very particularly Mexico. As detailed in the corresponding section in this report: close to 20 Mexican scientists have passed through our research group

APPENDIX I Work on HTSC

Professor Miguel Á. Alario-Franco has substantially contributed to the knowledge of High Temperature Superconductors both in the synthesis of new materials and in the study of the oxygen content in Cuprates and its influence in the structural, compositional and superconducting properties; in particular the critical temperature: T_c.

Some of the highlights of this work are as follows:

In the late eighties, his group prepared the new Ba₂SmCu₃O_{7-x}, with the then record of T_c = 96.5 K (Mat. Res. Bulletin 23 (3), 313 (1987)) and established the nature of the ordered orthorhombic phase at mid oxygen composition (Phys. Rev. B 36 (13),

7118 (1987)). Of the same period is the work reporting the first single crystal growth and structure determination of $\text{Ba}_2\text{PrCu}_3\text{O}_7$ and a discussion of its non-superconducting character (Solid State Comm. 67(4) 369 (1988)).

Later on, his work encompasses, from the discovery of a new family of non-toxic superconductors: $\text{CuBa}_2\text{Can-1CunO}_{2n+2+x}$. (Physica C: Superconductivity 222 (1-2), 52-56(1994) to the influence of pressure in SC cuprates (Solid.State Comm. 9 (2), 131-135(1995). The T_c attained in this system, 120 K, stands as a record for non-toxic cuprates under pressure.

They have also demonstrated a novel Red/Ox mechanism in the oxidation –and concomitant very marked increase in T_c - of cuprates having two different transition metals: $\text{Mo}_{0.3}\text{Cu}_{0.7}\text{Sr}_2\text{RECu}_2\text{O}_{7+x}$ (Dalton Transactions: 44(23) 10795-805(2015)).

The recent study of Alario-Franco et al of the influence of very high oxygen pressure in the structure, electronic properties and critical temperatures of those molibdo-cuprates, is both original and very relevant to the understanding of superconducting materials:

In such a work, the very subtle structural modifications originated in the oxidation process, appear to be closely related to, both, cationic and anionic disorder and the inter-bilayer/intra-bilayer distances balance, associated to the apical distance. Even more, this can be related to the increase in T_c through the transfer of charge as determined, in the bulk, by means of EELS (Presented at Symposium “Towards Room Temperature Superconductivity” Chapman University, Orange Ca (USA): 5/8/2017-5/9/2017. Publication: Quantum Stud: Math. Found. 5, 65 (2018).

In another recent publication: Dalton Transactions (2017)DOI: 10.1039/c7dt01974b, a very detailed analysis is performed, for the first time, of the influence of nanoparticle size in the presence, and the coexistence, of magnetism and superconductivity in YBCO and their suppression by a magnetic field.

In the latest paper of the group, Inorg. Chem. 57 (19), 12038–12049 (2018), the influence of the Rare Earth on the superconducting properties of the Transition Element substituted $\text{MoxCu}_{1-x}\text{Sr}_2\text{RECu}_2\text{O}_y$ cuprates has been explained. Selecting three groups of RE elements attending to their different size: small atoms (Yb and Tm), medium one (Gd) and big ones (Nd and Pr) and with the use of ARTEM, X-ray, Neutrons and electron diffraction and spectroscopic analysis, we have demonstrated that the increase of structural disorder in either anionic or cationic disorder, complemented with a decrease in the hole content, play a major role in the vanishing of superconductivity in this type of system.

Present work concerns the use of various oxidation processes O₂ up to 80 Kbar; O₃; chemical & electrochemical oxidation of cuprates, in the system MxCu_{1-x}Sr₂RECu₂O_{7+δ} (M = Mo and Fe) [SEP] trying to produce permanent structural modifications, related to the apical oxygen distance, analogous to those transiently observed by pump and probe irradiation experiments in the THZ range, that put YBCO T_c over Room Temperature .

Teaching work

A brief consideration about my participation in the teaching of Chemistry.

In relation to teaching, it should be noted that, in addition to the aforementioned Solid-State subject, we have taught in several other subjects in the Faculty of Chemical Sciences of our University: General Chemistry, Basic Inorganic Chemistry, Advanced Inorganic Chemistry, and Materials Chemistry and in various Seminars and Tutorials Over more than 50 years, I estimate that I have taught more than 10,000 students!

APPENDIX II: Solid-State Chemistry Program:

4th Academic year of the Degree in Chemical Sciences.

Specialties: Fundamental and Materials Science.

- I.- The Chemistry of the Solid State: Introduction. The ideal Solid. Crystal structures. The Chemistry of the Solid State in the Science of Materials.
- II.- Electronic structure of solids. Bands in solids. Electrical and magnetic properties. Structural families: Rutile, Perovskite, Spinel ... Metal /Insulator transitions (MIT): Goodenough model. Model of Hoffman-Burdett. Superconducting (HTSC) and Magneto-resistant materials (GMR / CMR) .
- III.- Phase diagrams: Definitions. Systems of one, two and three components.
- IV.- Phase transitions. Introduction. Types. Thermodynamic aspects. Kinetics of phase transitions. Order-disorder relationships
- V.- Defects in solids

V-1 .- Types of defects: Punctual, complex, linear, extended.

V-2.- Thermodynamics of the formation of defects.

V-3.- Thermal properties of solids: phonons.

V-4.- Color centers.

V-5.- Dislocations.

V-6.- Extended structural defects.

V-7.- Extended compositional defects.

VI. - No stoichiometry. Solid solutions: Thermodynamic and kinetic aspects. Modes of incorporation of non-stoichiometry.

VI-1 Homologous series. Intergrowths

VI-2 Infinitely adaptable structures Influence of non-stoichiometry in the properties of solids.

VII.- Reactions in solid state.

VII-1.Kinetics and reaction mechanisms. Material transport: diffusion in solids. Phenomenology: Mechanisms of diffusion. Ionic conductivity.

VII-2 Types of reactions in solid state:

Solid-gas reactions. Kinetics and reaction mechanisms.

Solid-solid reactions. Displacement reactions. Topotactic reactions.

Intercalation reactions. Kinetics and mechanisms of intercalation. VIII.-

Ionic conductors. Ionic conductivity in solids. Measurement of ionic conductivity.

Ionic crystals. Solid electrolytes. Applications: electrochemical cells, fuel cells, sensors.

IX.- Solid preparation strategies. Methods based on chemical precursors. High pressure techniques. Hydrothermal synthesis Ion exchange reactions. "Chimie douce-soft chemistry". Other methods.

X.- Growth of crystals Flux method Czochralski method. Bridgman and Stockburger method. Fusion by zones. High Pressure. Preparation of films.

DOCTORAL COURSE

Superconductivity and Superconducting Materials (Since 1986...)

The Dawn of Superconductivity: From Mercury to A-15s

The fabulous world of Cuprate Superconductors

Copper-free superconductors.

"The Iron Age"

Pressure and superconductivity: Hydrogen

Transient superconductivity: at room temperature

1) Superconducting hydrides.

2) Optical stimulation of superconductivity

What are superconducting materials used for? A world of applications.

Teaching at Harvard Royal Complutense College

Likewise, within our participation in the activities of the Real Colegio Complutense at Harvard University, <https://rcc.harvard.edu/> of whose academic council Complutense University/Harvard University, I was a counsellor-member from its inception in 1988, until 2014.

In this capacity I did participated in the organization and taught many classes on "Atmospheric Chemistry, the Greenhouse Effect and the Ozone Hole", in the "Postgraduate Course for Iberoamerican Students on Environmental Sciences and Law"; a course on the Environment in which professors from both universities participated and in which, on two occasions, the Nobel Prize winner Mario Molina from MIT, of Ozone hole fame, collaborated: This international course took place in four consecutive summers starting in 1995.

Miscellanea

As one of the high points of this presentation, we would like to point out that, on the occasion of my *sixtieth birthday* (2002), a scientific-tribute session was held at the Faculty of Chemical Sciences of the Complutense University, in which, in addition to my Teacher and Master, Professor Dr. Andrés Mata Arjona, intervene the great majority of my disciples and some colleagues who kindly presented some of their research work on Solid State Chemistry. The program of the meeting is set out below.



Also, on the occasion of this 60th anniversary, the Mexican scientists: Pablo de la Mora, Miguel Castro and Gustavo Tavizón, from the Faculties of Physics and Chemistry of the National Autonomous University of Mexico, dedicated an article to me in the most important journal dedicated to Solid-State Chemistry:



Journal of Solid-State Chemistry: Volume 169, Issue 2, December 2002, Pages 168-175

Following this line of celebrations, it is also interesting to mention that, just this present year of 2022, on the occasion of *my eightieth birthday* an International Symposium has been organized by the same research group that I founded, several of whose components were indeed my students.

The symposium is entitled:

“From Solid State Chemistry to Materials Science and Technology: A tribute to Professor Dr. Miguel Angel Alario -Franco, Emeritus Professor at Complutense University in his eightieth birthday.”

And will take place the 6th, 7th & 8th of October of 2022 in the Faculty of Chemistry of Complutense University, with the participation of around 25 distinguished international Solid- State scientists.

Also, there is presently in the press a ***Special Issue*** of the Journal of Solid-State Chemistry.

This Zeitschrift is entitled: ***Synthesis, Structure and Microstructure of novel Non-molecular Materials - Dedicated to Prof. Miguel Ángel Alario-Franco on the occasion of his 80th Birthday.***

It is being edited by Elizabeth Castillo-Martínez, David Ávila-Brandé, Jesús Prado-Gonjal & Elena M. Mesa-Bribián, some of my long-date collaborators and friends.

The dedication of this special issue reads:

To Professor Alario-Franco on his 80th birthday.

A pioneer in Solid State Chemistry from the mid-seventies, his notorious contributions to the field encompass the synthesis of novel materials, from room to high pressures and their characterization at the structural and microstructural level by means of TEM/ED & HREM. This implied the setting up of an Electron Microscopy Centre and a High-Pressure Laboratory, among the first of its kind in Europe, as well as the training of a significant number of international bright students that are disseminating the knowledge of the Chemistry of Materials and their inherent fundamental properties.

MADRID 29-VIII-2022



PROF. MIGUEL ÁNGEL ALARIO-FRANCO