iSQCH
Instituto de Síntesis Química y Catálisis Homogénea

CSIC
Consejo Superior de Investigaciones Científicas

Universidad Zaragoza
1542

Institute for Chemical Synthesis and Homogeneous Catalysis

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Zaragoza
24 April 2017

CSIC
Consejo Superior de Investigaciones Científicas

icma
Instituto de Ciencia de Materiales de Aragón

Universidad Zaragoza
1542

Joint venture UNIZAR - CSIC
October 1985

Foundation Agreement
5 April 2011

iuch
Instituto Universitario de Catálisis Homogénea

December 2013
University Institute

icma
Instituto de Ciencia de Materiales de Aragón

CEQMA
Centro de Química y Materiales de Aragón

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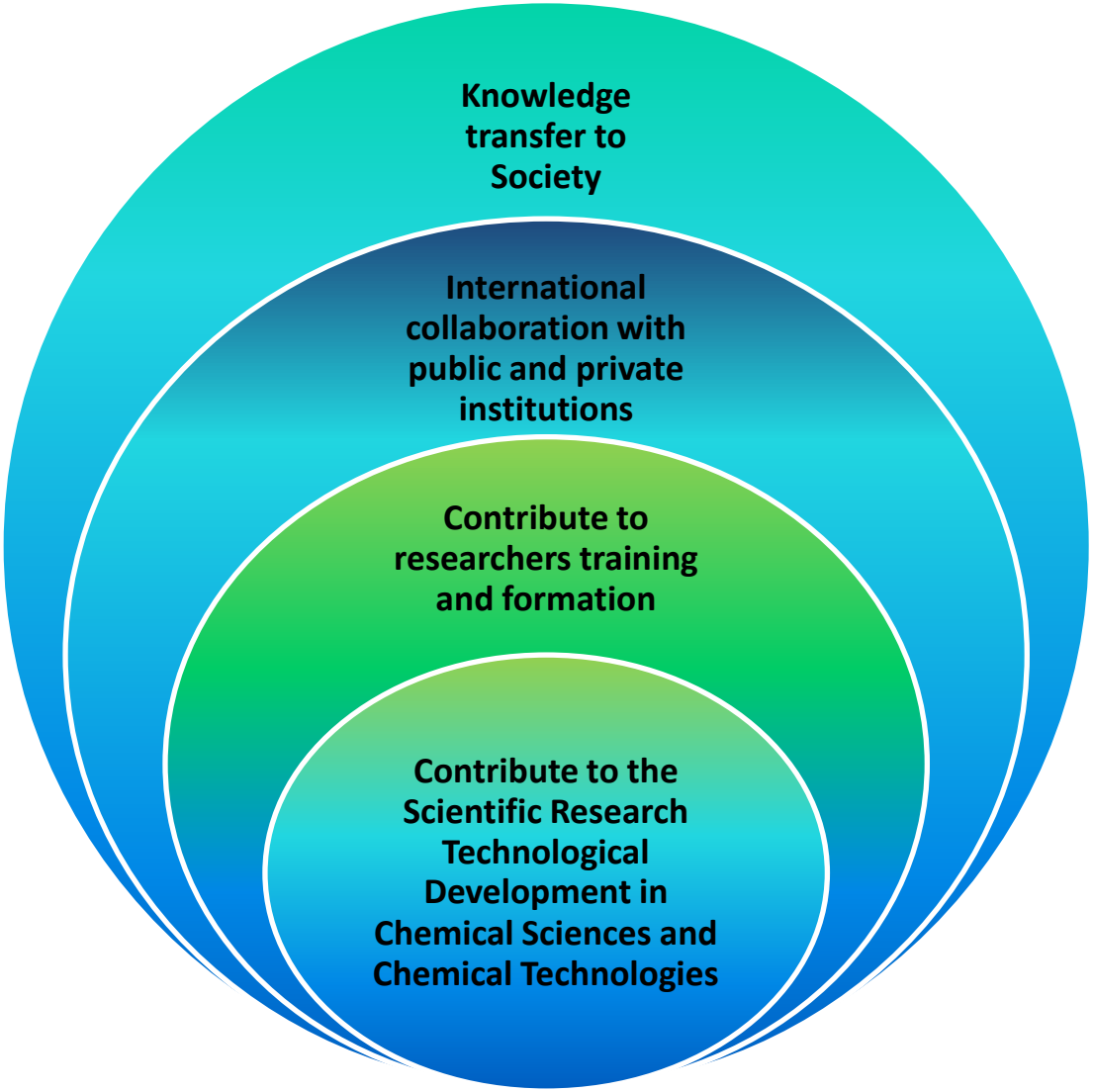
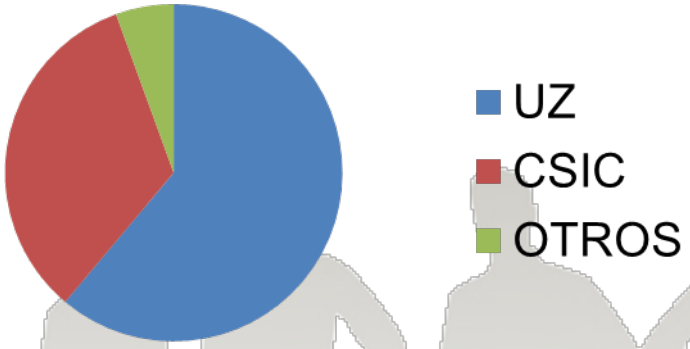
... Our mission

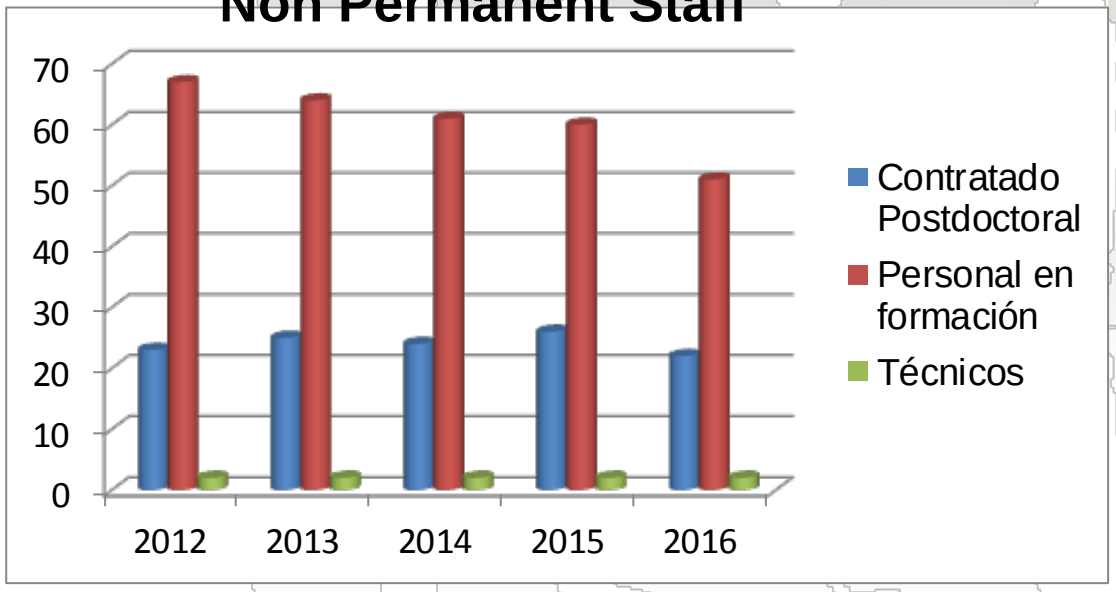

Knowledge transfer to Society
International collaboration with public and private institutions
Contribute to researchers training and formation
Contribute to the Scientific Research Technological Development in Chemical Sciences and Chemical Technologies

... our human resources

Permanent Staff: 66



Non Permanent Staff



TOTAL human resources:

2012 – 159
2013 – 158
2014 – 155
2015 – 156
2016 – 143

Approx. percentage:

CSIC 35% / UNIZAR 65%

(Chem. Building, 2º, 3º y 4º)

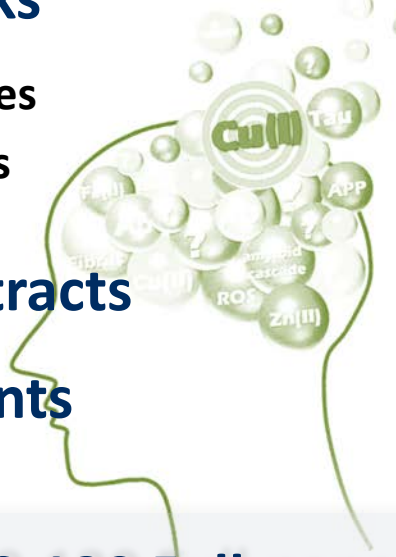
... On our funding support

Año	*2009*	*2010*	*2011*	2012	*2013*	*2014*	*2015*	*2016*
Spanish funding Agencies	1254	890	2444	1670	876	1318	*526*	*813*
European funding	12	274	291	32	224	12	22	18
Private Contracts	80	115	119	231	433	514	429	302
Regional funding	406	261	521	417	113	168	145	155
Other	95	19	0	0	23	15	63	25
TOTAL	**1847**	**1559**	**3375**	**2350**	**1669**	**2027**	**1185**	**1313**

- **Mean competitive funding of the Institute over 2.0 M€/year**
- **Continuous increase on private funding (2017 more than 700 K€)**
- **Strategic up-to-date technical equipments well over 5 M€**

… on scientific production

	2010	2011	2012	2013	2014
Full Papers ISI	**97**	**109**	**131 (8)**	**114 (86)**	**115 (84)**
Communicatios	107	94	165	213	197
Books	**6**	**1**	**5**	**9**	**5**
Courses	61	58	66	54	64
Events	8	5	3	3	5
Contracts	**12**	**14**	**14**	**18**	**14**
Patents	**3**	**2**	**3**	**3**	**3**



- ❖ 100-130 Full papers on high impact ISI journals(75-80 % in Q1)
- ❖ 2-3 International Patents/year (1 in use, 6000 €/year revenues)

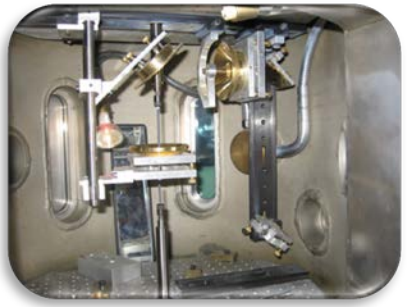
... On scientific formation

	2011	2012	2013	2014	2015	2016
Competitive PhD Grants	5	4	3	7	4	5
CSIC internal PhD Grants	2	3	2	2	-	-
Aragón Regional Grants	2	1	2	6	3	3
Other PhD Grants	6	10	10	-	3	6
Total PhD Grants/year	**15**	**18**	**17**	**15**	**10**	**14**
PhD Thesis	**4**	**10**	**5**	**15**	**14**	**16**
Master Thesis			**11**	**12**	**13**	**14**
Post-doc Ramón y Cajal	1	-	-	1	-	1
Internal CSIC Post-doc	1	2	1	1	-	-
Private post-doc contracts	4	2	4	3	3	6
Total post-doc researchers	**6**	**4**	**5**	**4**	**3**	**7**

... Special Equipment and Technical Services

X-RAY DIFFRACTION

OFICINA TÉCNICA



ELEMENTAL ANALYSIS

MASS SPECTROMETRY

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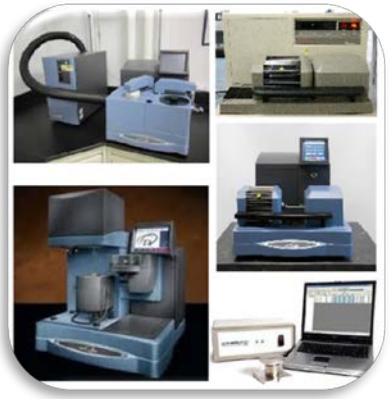
NUCLEAR MAGNETIC RESONANCE



CARACTERIZACIÓN DE SUPERFICIES Y RECUBRIMIENTOS

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THERMAL ANALYSIS

CROMATOGRAPHY AND SPECTROSCOPY

... Special Equipments and Services

- **NMR Service (SRMN)**

  7 RMNs (2 x 500MHz solids, 2 x 400MHz, 3 x 300 MHz)

- **Single-crystal X-Ray Diffraction Service(SRX)**

  2 x 4-circle automatic diffractometers

- **Mass Spectrometry Service (SEM)**

  4 Spectrometers (Maldi/Tof, Electrospray, APCI, APPI)

- **Cromatography and Spectroscopy Service**

  4 HPLC mass detector chromatographs (1 semidispersive and one analytic), Circular Dicroism, Dispersive Raman, …

- **Elemental Analysis Service (SAE)**

  1 Perkin Elmer C,N,H,S-Elemental Analysis Instrument

... on Institute Organization

- **4 Research Departments:**
  - ✓Organometallic and Coordination Complexes (22 / 34)*
  - ✓Catalysis and Catalytic Processes (31 / 48)*
  - ✓Synthesis and Structure of Biomolecules (10 / 23)*
  - ✓Bonding Activation by Metal complexes (23 / 41)*

* PhD/Total

- **14 Stable Research Groups**

... Research Groups

I.- Design of Coordination Complexes with Relevant Properties (Prof. C. Gimeno)
Inorganic and Organometallic Chemistry (Dr. B. Menjón)
Applied Organometallic Chemistry (Prof. M. Laguna)

II.- Hetereogeneous Catalysis for the Selective Organic Syntheses (Prof. J.A. Mayoral)
Enantioselective Homogeneous Catalysis (Prof. D. Carmona)
Homogeneous Catalysis by Organometallic Complexes (Prof. L.A. Oro)
Enantiopure Compounds and Sustainable Processes (Dr. M.D. Díaz de Villegas)

III.- Peptids and Aminoacids (Prof. C. Cativiela)
Bioorganic Chemistry (Prof. T. Tejero))

IV.- Organometalics and Catalysis (Prof. M.A. Esteruelas)
Inorganic Molecular Arquitectures and their Applications (Dr. C. Tejel)
Catalysts and Mechanisms (Dr. E. Sola)
Molecular Activation through Organometallics(Dr. E. Urriolabeitia)

Institute for the Chemical Synthesis and Homogeneous Catalysis

ISQCH - Instituto de Síntesis Química y Catálisis Homogénea
Facultad de Ciencias, Universidad de Zaragoza - CSIC
C/ Pedro Cerbuna, 12. Zaragoza 50009. Spain

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1.- Organometallic and Coordination Complexes

1.1.- New Coordination Complexes with new Relevant Properties.

(Anticancer agents / Catalytic Properties / Nanomaterials / New Luminiscent Materials)

1.2.- New Molecular and Supramolecular Transition Metal Systems

(Magnetic Properties / Special Reactivity)

1.3.- Applied Organometallic Chemistry

(Water soluble Organometallics / Catalytic, Optic and Biological Properties / Hybrid Materials / Lanthanides and Luminiscent Materials)

2.- Catalysis and Catalytic Processes

2.1.- Homogeneous Catalysis by Organometallic Complexes
(Selective Catalysts and Atomic Economy / CO2 Activation and Reactivity / Polymerization processes / Transition Metal Activity)

2.2.- Heterogeneous Catalysis in Selective Organic Synthesis

(Biodiesel Catalysis / Immobilized Quiral Catalysts / Sustainable Selective Processes)

2.3.- Homogeneous Enantioselective Catalysis

(Asymmetric Catalysis / Applications on Enantioselective Synthesis/ New Pharmaceuticals / New Fragrances, Pesticides and other Chiral Compounds)

2.4.- Enantiopure Compounds and Sustainable Processes

(Biologically active compounds / Chiral Precursors / Selective Catalysis)

3.- Synthesis and Structure of Biomolecules

3.1.- Aminoacids and Peptides

(No proteinogenic aminoacids / Assymetric Synthesis / Biological Properties / Structure – Properties relationships)

3.2.- Bioorganic Chemistry

(Biologically active Chemicals / Nucleosides, Carbohydrates, Glicomimetic compounds / Organocatalysis)

4.- Bonding Activation by Metal Complexes

4.1.- Forming and Breaking C-H, C-C y C-X bonds through organometallic Complexes

(Functionalization of Organic Molecules / Energetic Bond Activation / H2O Breaking for energy processes / Hydrogenation / Selective Proceses)

4.2.- Molecular Activation through Organometallics

(Oxygen Activation / Mixed Valence Complexes / New Phosphacenes)

4.3.- Inorganic Molecular Architecture and Applications

(CO2 Reactivity / Molecule Functionalization / Metalomesogens /

4.4.- Mechanism and Activations

(Chemical Mechanisms / C-H Activation / H2O oxidation)

Private Research Collaborations

Detection, quantification and separation of water soluble natural polymers of industrial relevance

New Coordination and Organomertallics Complexes as Additives for Industrial Paints

FACI S.p.A. Spain Branch

Identification and Analysis of new Interest Products

Mass Espectrometry applied to Filtration Residues

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