

CV date	04/09/2021
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A.1. Current position

Name of University/Institution	Universidad de Cordoba		
Department	Quimica Organica		
Address and Country	Edificio Marie Curie, Ctra Nnal IV-A, Km 396, E14014, Cordoba, Spain		
Current position	Profesor Titular de Universidad	From	02/12/2017
Espec. cód. UNESCO	330301		
Keywords	Organic Chemistry, Green Chemistry, Biomass valorisation, heterogeneous catalysis, flow chemistry, nanomaterials		

A.2. Education

Title	University	Year
PhD	Universidad de Cordoba	2005
BSc	Universidad de Cordoba	2001

A.3. Indicators of Quality in Scientific Production *(See the instructions)*

Total number of citations: >30,000 (WOS); >33,000 (google scholar), June 2021
 Average number of citations in the past 5 years: >3000 per year
 Total peer-reviewed publications: 589
 Total publications in Q1 journals (JCR 2018): >350 (84%)
 Total publications in D1 journals (JCR 2018): >250 (50%)
h-index: 78 (WOS); 84 (google scholar)
 Number of PhDs granted in the past 5 years: 15

2018 Highly Cited Researcher (Clarivate Analytics)

2019 Highly Cited Researcher (Clarivate Analytics)

2020 Highly Cited Researcher (Clarivate Analytics)

Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

Prof. Luque started his independent career and scientific group NANOVAL in 2009 after being granted a RAMÓN Y CAJAL FELLOWSHIP, being currently Profesor Titular de Universidad at UCO. The NANOSCALE CHEMISTRY & BIOMASS/WASTE VALORIZATION group (NANOVAL, <http://www.uco.es/users/q62alsor/index.html>) is currently established as an internationally consolidated group with a current total funding of 2.5 million EUROS (average 200,000-300,000 euros per year) currently composed by ca. 30 scientists including 9 Doctors/Professors, 3 postdoctoral scientists, 3 Juan de la Cierva Fellows and more than 15 Ph.D students, with several Marie Curie Fellows associated to H2020 projects with Industry and Academia (<http://www.uco.es/~q62alsor/people.html>).

Prof. Luque is a 2018, 2019 and 2020 Highly Cited Researcher by Clarivate Analytics, accounting for the 1% of citations in his field of expertise (selected in Cross-Field), currently the ONLY 2018, 2019, 2020 Highly Cited Researcher from Universidad de Cordoba and ranked top 35 scientist from ALL DISCIPLINES IN SPAIN taking into account 2018, 2019 and 2020 Highly Cited Researchers list and h-index, <http://www.webometrics.info/en/ClarivateHiCited>.

In addition to such remarkable achievements, Prof. Luque is also Director of the Center for Molecular Design and Synthesis of Innovative Compounds for Medicine at RUDN University in Moscow, Russia, since early 2018, <http://eng.rudn.ru/media/news/science/chemist-with-a-worldwide-reputation-becomes-the-head-of-research-laboratory-at-rudn-university/>, being also Distinguished Chair Professor from the Department of Applied Chemistry at Xi'an Jiaotong University (China) from 2019 and more recently DFSP Distinguished Scientist at King Saud University in Saudi Arabia.

Prof. Luque also became Editor-in-chief of the journal Molecular Catalysis from Elsevier (impact factor 3.768) in January 2018, <https://www.journals.elsevier.com/molecular-catalysis/announcements/professor-rafael-luque-appointed-as-editor-in-chief>, previously having also various Visiting Professorship positions in China (CIAC Changchun, Xiamen

University and South China University of Technology), Hong Kong (HKUST and City University of Hong Kong), Brazil (Universidade Federal de Pelotas), Germany (Max Planck Institute for Colloids and Interfaces), France (UTC) and more recently Italy (Università Ca Foscari, Venezia). Prof. Luque serves as Editorial/Advisory Board member of several (>15) International journals including Chemical Society Reviews (i.f. 40.182) and Green Chemistry (i.f. 9.405) from the RSC, ACS Sustainable Chemistry & Engineering (i.f. 6.96) from ACS, ChemCatChem (i.f. 4.674) from Wiley, Catalysis Communications (i.f. 3.463) from Elsevier and Topics in Current Chemistry (i.f. 5.537) and Scientific Reports (i.f. 4.122), among others.

Rafael received also a long list of awards including the Marie Curie Prize from Instituto Andaluz de Química Fina in Spain (2011), the Green Talents award from the Federal Ministry of Education and Research in Germany (2011), the TR35 Spain from Technology Review and MIT as one of the top 10 young entrepreneurs in Spain (2012), the RSC Environment, Sustainability and Energy Early Career Award (2013) from the Royal Society of Chemistry UK, the 2015 Lu Jiaxi lectureship from the College of Chemistry and Engineering in Xiamen University (China) and very recently the 2018 ACS Sustainable Chemistry & Engineering Lectureship award. Prof. Luque is also a young entrepreneur being co-founder of Starbon Technologies Ltd. At the UK, Green Applied Solutions S.L.U. in Spain.

Part C. RELEVANT MERITS

C.1. Selected Publications from over 600, for a full list, please see <http://www.uco.es/~q62alsor/publications.html###>

L. Yang, J. Huang, J. Cen, Z. Rui, **R. Luque***, P. Duan, Lewis acid (Ni^{2+} , $\text{Co}^{2+/3+}$ or Zn^{2+}) modified electron-deficient Ir^{4+} in IrO_2/CuO for promoting methane oxidation to ethanol and methanol, *J. Mater. Chem. A*, 2021, 9(11), 7094–7101. Impact factor 10.733 (Q1, D1).

Mechanistic insights into interfacial nano-synergistic effects in trimetallic Rh-on-NiCo on-CNTs for room temperature solvent-free hydrogenations, L. Zhu, B.H. Chen, **R. Luque***, *Appl. Catal. B* 2021, 297, 120404. Impact factor: 16.34 (Q1, D1).

Scrap waste automotive converters as efficient catalysts for the continuous flow hydrogenations of biomass derived chemicals. C. Cova, A. Zuliani, R. Manno, V. Sebastián, **R. Luque***, *Green Chem.* 2020, 22, 1414-1423. Impact factor 9.405 (Q1, D1).

Novel catalytic routes for the preparation and upgrading of biomass-derived furfural and 5-hydroxymethylfurfural, C. Xu, E. Paone, D. Rodríguez-Padrón, **R. Luque***, F. Mauriello*, *Chem. Soc. Rev.* 2020, 49, 4273-4306. Impact factor: 42.846 (Q1, D1).

Insights into the Selective Oxidation of 5-Hydroxymethylfurfural to 5-Hydroxymethyl-2-furancarboxylic Acid Using Silver Oxide, D. Zhao, D. Rodríguez-Padrón, **R. Luque***, C. Len*, *ACS Sust. Chem. Eng.* 2020, 8, (23), 8486-8495.

Waste-to-wealth: biowaste valorization into valuable bio(nano)materials, C. Xu, M. Nasrollahzadeh, M. Selva, Z. Issaabadi, **R. Luque***, *Chem. Soc. Rev.* 2019, 48, 4791-4822. Impact factor: 42.846 (Q1, D1).

D. Alba-Molina, A.R. Puente-Santiago, J.J. Giner-Casares, E. Rodríguez-Castellon, M.T. Martín-Romero, L. Camacho, **R. Luque***, M. Cano. Tailoring ORR and HER electrocatalytic performances of gold nanoparticles through metal-ligand interfaces. *J. Mater. Chem. A* 2019, 7, 20425-20434. Impact factor 10.733 (Q1, D1).

K. Shen, L. Zhang, X. Chen, L. Liu, D. Zhang, Y. Han, J. Chen. J. Long, **R. Luque**, Y. Li, B. Chen. Ordered macro-microporous metal-organic framework single crystals. *Science* 2018, 359, 206-210. Impact factor: 37.20 (Q1, D1).

C.M. Cova, A. Zuliani, A. R. Puente-Santiago, A. Caballero, M.J. Muñoz-Batista, **R. Luque***. Microwave-assisted preparation of Ag/Ag₂S carbon hybrid structures from pig bristles as

efficient HER catalysts, *J. Mater. Chem. A* 2018, 6, 21516-21523. Impact factor 9.93 (Q1, D1)

R. Fang, P. Tian, X. Yang, **R. Luque***, Y. Li, Encapsulation of ultrafine metal-oxide nanoparticles within mesopores for biomass-derived catalytic applications. *Chem. Sci.* 2018, 9, 1854-1859. Impact factor 9.06 (Q1, D1).

H. Liu, L. Chang, C. Bai, L. Chen, **R. Luque***, Y. Li. Controllable encapsulation of clean metal clusters within MOFs through kinetic modulation: towards advanced heterogeneous nanocatalysts. *Angew. Chem. Int. Ed.* 2016. 55. 5019-5023. Impact factor: 11.99 (Q1, D1).

C.2. Research Projects and Grants

PID2019-109953GB-I00. **Title:** Mechano-catalysis: advances in the design of nanocatalysts and applications in biomass conversion Call: MINECO. FEDER. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2020-2024. **Grant money:** 254.000,00 €

P18-RT-4576. **Title:** Waste-to-pharma: conversion of furanics to active pharmaceutical ingredients using green chemical methods Call: Consejería Innovación, Ciencia y Empresa de la Junta de Andalucía. **IP:** Rafael Luque Alvarez de Sotomayor. Universidad de Córdoba. 2020-2024. **Grant money:** 128.000,00 €.

H2020-MSCA-RISE-2018-823939. **Title:** Green Enantioselective Halogenation for Drug discovery and manufacture GreenX4Drug. European Commission. H2020-MSCA-RISE-2018. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2019-2023. **Grant money:** 286.000,00 €

H2020-MSCA-ITN-2016- 721290. **Title:** COSMIC. European Training Network for continuous Sonication and Microwave Reactors. European Commission. Call: H2020-MSCA-ITN-2016. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2016-2020. **Grant money:** 226.272,96 €

CTQ2016-78289P. **Title:** Desarrollo de procesos continuos químico-enzimáticos para valorización de biomasa. Call: MINECO. FEDER. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2017-2020. **Grant money:** 223.850,00 €

H2020-MSCA-ITN-2015- 675325. **Title:** Humins as Green and Sustainable precursors of eco-friendly building blocks and materials. European Commission. **Call:** H2020-MSCA-ITN-2015. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2016-2020. **Grant money:** 247.872,76 € http://cordis.europa.eu/project/rcn/198284_en.html

H2020-MSCA-ITN-2014-641861. **Title:** Photo4future-accelerating photoredox catalysis in continuous flow systems. European Commission. **Call:** H2020-MSCA-ITN-2014. **IP:** Rafael Luque Alvarez De Sotomayor. Universidad de Córdoba. 2015-2018. **Grant money:** 247.873,00 €. http://cordis.europa.eu/project/rcn/193858_en.html

P10-FQM-6711. **Title:** Síntesis y caracterización de materiales sólidos utilizables como catalizadores y fotocatalizadores en procesos de química benignos con el medio ambiente (química sostenible). Consejería Innovación, Ciencia y Empresa de la Junta de Andalucía. **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. 2011-2016. **Grant money:** 152.000,00 €.

COST FP-1306. **Title:** Valorisation of lignocellulosic biomass side streams for sustainable production of chemicals, materials and fuels using low environmental impact technologies. COST Horizon2020. **Action Chair:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. 2014-2018. **Grant money:** 800.000,00 €.

CTQ2011-28954-C02-02. **Title:** Diseño de nanomateriales catalíticos para la producción de compuestos químicos de alto valor añadido y biocombustibles a partir de valorización de biomasa. Ministerio de Ciencia e Innovación. **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. 2012-2014. **Grant money:** 41.140,00 €.

C.3. Contracts (transfer of knowledge)

Molienda de principios activos vegetales a tamaño de partícula nanométrico **Company:** PHYTOPLANT RESEARCH S.L. **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. **Start-End date:** 2015-2016. **Grant money:** 6.000,00 €.

Reacciones químicas de condensación de compuestos orgánicos y de desoxigenación Company. Petrowood combustiveis **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. **Start-End date:** 2015-2016. **Grant money:** 20.000,00 €.

Síntesis de un aminoácido modificado mediante Click Chemistry para su uso en proteómica. **Company:** CANVAX BIOTECH S.L. **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. **Start-End date:** 2015-2016. **Grant money:** 2.428,52€.

Nanotecnología para nuevos desarrollos en polioles. **Company:** REPSOL YPF, S.A. **IP:** Rafael Luque Alvarez de Sotomayor. Dpto. Química Orgánica de la Universidad de Córdoba. **Start-End date:** 2012-2013. **Grant Money:** 12.000,00 €.

C.4. Patents and other IPR

Vitaliy Budarin, Robin Jeremy White, **Rafael Luque**, Krzysztof Milkowski, James Hanley Clark, Duncan James MacQuarrie. **Ref:** US 08790548 B2 **Title:** Carbonaceous Materials. **Priority country:** Estados Unidos. **Date:** 29/07/2014. University of York. **Licensed to:** Starbon Technologies Ltd., currently under exploitation by Sigma-Aldrich Ltd.

Rafael Luque, Vitaliy Budarin, Robin Jeremy White, James Hanley Clark. **Ref:** WO 2009044146 A1. **Title:** Metal nanoparticles. **Priority country:** Reino Unido. **Date:** 09/04/2009. University of York. **Licensed to:** Starbon Technologies Ltd.

Rafael Luque, Alina M. Balu, Ana Franco Losilla, Antonio A. Romero. **Ref:** P201730465 **Title:** PROCEDIMIENTO PARA LA OBTENCIÓN DE BIOSÍLICE A PARTIR DE CÁSCARA DE ARROZ. **Priority country:** Spain. **Date:** 29/03/2017. Universidad de Córdoba

C.5 Other merits

Editor-in-chief of Molecular Catalysis (Elsevier), former Journal of Molecular Catalysis A: Chemical, impact factor 3.7, from January 2018; Editor-in-Chief Porous Materials Section, Materials (MDPI), i.f.: 3.0; Scientific reviewer of several journals from Elsevier (>60 journals), ACS (15 journals), Springer (12 journals), Taylor & Francis (5 journals) and RSC (32 journals) with over 200 refereed manuscripts per year in journals including Science, Nature, Angewandte Chemie Int. Ed., JACS, Nature Communications, Advanced Materials, Energy and Environmental Science and others; Fellow of the Royal Society of Chemistry (FRSC, from 2015); Member of Sociedad Española de Catálisis (SECAT, from 2002); Member of American Chemical Society (Division of Environmental Chemistry, from 2010).