



### CURRICULUM VITAE (CVA)

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#### Part A. PERSONAL INFORMATION

CV date 19/09/2022

First name	Maria Victoria		
Family name	Borrachero		
Gender (*)	Female	Birth date	
Social Security, Passport, ID number			
e-mail	vborrachero@cst.upv.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-7873-0658	

(\*) Mandatory

#### A.1. Current position

Position	Catedrático de universidad		
Initial date	22/02/ 2008		
Institution	Universitat Politècnica de València (UPV)		
Department/Center	D. Ingeniería de la Construcción y P.I.C/ Escuela Técnica Superior de Ingeniería de Caminos, Canales y Puertos		
Country	Spain	Teleph. number	963877564
Key words	Inorganic binder, Microstructural characterization, Alkaline activation, non destructive assays, Reuse of wastes, Pozzolan activity		

#### A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1999 to 2008	Profesor Titular de Universidad/ Universitat Poliècnica de València
1998 to 1999	Profesor Titular de Escuela Universitaria/ Universitat Poliècnica de València
1991 to 1998	Profesor Asociado/ Universitat Poliècnica de València

#### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD	Universidad de Murcia	1990
Licensed	Universidad de Murcia	1985

#### Part B. CV SUMMARY

My academic background is Chemistry degree in 1985 by Universidad de Murcia and a doctoral thesis in 1990 at the same university. During my doctoral and postdoctoral stage, my expertise was in inorganic chemistry (organometallic chemistry). Nevertheless, since 1991 my focus has been on the chemistry of building materials and their impact on the environment. Specifically, I have conducted several works in the field of materials for civil engineering:

a) Valorization of agroindustrial waste materials for application as construction material, especially in the production of mortars and concretes: fly ash, blast furnace slag, silica fume,



fluid catalytic cracking residue, ceramic sanitary-ware, rice husk ash, rice straw ash, sugarcane bagasse ash.

b) Use of different instrumental techniques for binder's characterization: thermogravimetric analysis, scanning electron microscopy, X-ray diffraction, infrared spectroscopy, etc.

c) Development of new methods for characterization of pozzolanic materials: pH and electrical conductivity methods; determination of amorphous silica content, etc.

d) Production and characterization (mechanical, microstructural and durability aspects) of alkali-activated cement using alternative materials as precursors: ceramic wastes, fluid catalytic cracking residue, vitreous calcium aluminosilicate.

e) Development of innovative alkali-activated systems using alternative alkaline activating solutions: rice husk ash, olive biomass ash, almond shell biomass ash and residual diatomaceous earth.

e) Assessment of carbon footprint for alternative alkali-activated cement compared to conventional cement.

f) Development of non-destructive tests for construction materials characterization based on electrical resistivity and vibration spectra: evaluation of linear and non-linear parameters and their correlation with degradation process of mortars and concretes.

I am co-author of 140 publications in indexed journals, 188 publications between national and international congresses. In the same way, I am co-author of 11 book chapters and participant in 35 research projects. I participated in 25 knowledge transfer contracts with companies and participated in a patent on the use of catalytic cracking catalyst residue for performance improvements in mortars and concretes. With this work, I obtained an H-index of 35. Reviewer of journals such as *Cement and Concrete Research* or *Construction and Building Materials*.

I have 5 six-year periods of research. I have also belonged to the committee of experts of the Aneca Academy program in Civil Engineering and Architecture. I am also a member of the committee of the accreditation agency of the community of Andalucía in the area of Engineering and Architecture. I have been an evaluator of research projects for the ANEP since 2007, uninterruptedly. I have been a project evaluator for the Ministry of Science and Technology during 2008 and 2012 for Civil Engineering and Architecture. I have also evaluated the Juan de la Cierva program in the 2016 academic year. In 2018, I evaluated groups at the CSIC.

During all these years as a researcher, I have been actively collaborating with national and international institutions. Collaborating with professors and researchers of the Universitat Jaume I de Castellón, Universidad de Alicante, Imperial College of London, Universidad Nacional de Colombia, Universidad Central Marta Abreu de las Villas (Cuba), UNESP Julio de Mesquita Filho (Brasil), Universidad de Atacama (Chile) and Universidad de Magallanes (Chile).

I have co-directed 9 doctoral theses, 22 master's thesis, and an advanced studies diploma. The students I have trained in research tasks have been of various nationalities. This knowledge transfer collaboration shows that many of these students have continued in the academic field. Others work in construction companies, such as cement companies, prefabricated, architectural design, etc.

## **Part C. RELEVANT MERITS**

### **C.1. Publications**

1. Pitolli, G.; Borrachero, M.V.; Soriano, L.; Payá, J.; Rossignolo, J. 2021. Comparison of original and washed pure sugar cane bagasse ashes as supplementary cementing materials. *Construction and Building Materials*, 272, 122001.
2. Hidalgo, S.; Soriano, L.; Monzó, J.; Payá, J.; Font, A.; Borrachero, M.V. 2021. Evaluation of rice straw ash as a pozzolanic addition in cementitious mixtures. *Applied Sciences*, 11, 773.
3. Tobón, J.I.; Mendoza, O.; Restrepo, O.J.; Borrachero, M.V.; Payá, J. 2020. Effect of different high surface area silicas on the rheology of cement pastes. *Materiales de Construcción*, 70, 1-9.
4. Font, A.; Soriano, L.; Tashima, M.M.; Monzó, J.; Borrachero, M.V.; Payá, J. 2020. One part eco-cellular concrete for the precast industry: functional features and life cycle assessment. *Journal of Cleaner Production*, 243, 118568.



5. Istuque, D.B.; Soriano, L.; Akasaki, J.L.; Melges, J.L.P.; Borrachero, M.V.; Monzó, J.; Payá, J.; Tashima, M.M. 2019. Effect of sewage sludge ash on mechanical and microstructural properties of geopolymers based on metakaolin. *Construction and Building Materials*, 203, 95-103.
6. Genovés, V.; Carrión, A.; Escobar, D.; Gosálbez, J.; Monzó, J.; Borrachero, M.V.; Payá, J. 2019. Nonlinear acoustic spectroscopy and frequency sweep ultrasonics: case on thermal damage assessment in mortar. *Journal of Nondestructive Evaluation*, 38, 1-14.
7. Gaviria, X.; Borrachero, M.V.; Payá, J.; Monzó, J.; Tobón, J.I. 2018. Mineralogical evolution of cement pastes at early ages based on thermogravimetric analysis (TGA). *Journal of Thermal Analysis and Calorimetry*, 132, 39-46.
8. Fernández, M.E.; Payá, J.; Borrachero, M.V.; Soriano, L.; Mellado, A.M.; Monzó, J. 2017. Degradation of postconsumer waste bottle fibers used in Portland cement based composites. *Journal of Materials in Civil Engineering*, 29, 04017183-1-0401783-9.
9. Reig, L.; Soriano, L.; Borrachero, M.V.; Monzó, J.; Payá, J. 2016. Influence of calcium aluminate cement (CAC) on alkaline of red clay brick waste (RCBW). *Cement and Concrete Composites*, 65, 177-185.
10. Borrachero, M.V.; Monzó, J.; Payá, J.; Vunda, C.; Velazquez, S.; Soriano, L. 2014. Spent FCC catalyst for improving early strength Portland cement. *ACI Materials Journals*, 111, 59-66.

## C.2. Congress

1. *Presentación oral*. Payá, J.; Monzó, J.; Roselló, Borrachero, M.V.; Font, A. Soriano, L. Cenizas alcalinas de biomasa: una alternativa para la estabilización de bloques de tierra compactada. 19º Seminario Iberoamericano de Arquitectura y Construcción con Tierra (SIACOT 2019), 15-18 octubre, Oaxaca de Juárez, México.
2. *Presentación oral*. Villca, A.; Soriano, L.; Borrachero, M.V.; Payá, J.; Monzó, J. Estudio de morteros mixtos cal/puzolana-geopolímero: resistencia a compresión y absorción de agua. XV Congreso Latinoamericano de Patología de la Construcción y XVII Congreso de Control de Calidad (CONPAT 2019), 8-10 octubre, Chiapas, México.
3. *Presentación oral*. Font, A.; Monzó, J.; Soriano, L.; Borrachero, M.V.; Payá, J. Nuevos hormigones celulares geopoliméricos aireados con agua oxigenada: Síntesis y propiedades. V Congreso Iberoamericano de Hormigón Autocompactante y Hormigones Especiales HAC 2018, 5-6 marzo, Valencia, España.
4. *Presentación oral*. Font, A.; Monzó, J.; Soriano, L.; Borrachero, M.V.; Payá, J. New cellular geopolymeric concretes (CGC) based on blastfurnace slag and spent FCC catalyst. 17th International Conference on Non-conventional Materials and Technologies (NOCMAT 2017), 26-29 noviembre, Yucatán, México.
5. *Póster*. Roselló, J.; Soriano, L.; Savastano, H.; Borrachero, M.V.; Santamarina, M.P.; Akasaki, J.L.; Payá, L. Microscopic and chemical characterization of elephant grass and corn leaves and their ashes. 16th International Conference on Non-conventional Materials and Technologies (NOCMAT2015), 10-13 agosto, Winnipeg, Canada.
6. *Presentación oral*. Marmol, G.; Savastano, H.; Bonilla, M.; Borrachero, M.V.; Monzó, J.; Soriano, L.; Payá, J. Ternary blended cementitious matrix for vegetable fiber reinforced composites. 15th International Conference on Non-conventional Materials and Technologies (NOCMAT2014). 23-25 noviembre, Pirassununga, Brasil.
7. *Presentación oral*. Castadelli, V.N.; Tashima, M.M.; Melges, J.L.P.; Akasaki, J.L.; Monzó, J.; Borrachero, M.V.; Soriano, L.; Payá, J. Preliminary studies on the use of sugar cane bagasse ash (SCBA) in the manufacture of alkali activated binders. 14th International conference on Non-Conventional Materials and Technologies (NOCMAT 2013), 24-27 marzo, Joao Pessoa, Brasil.
8. *Presentación oral*. Tashima, M.M.; Soriano, L.; Akasaki, J.L.; Castadelli, V.N.; Monzó, J.; Payá, J.; Borrachero, M.V. Spent FCC catalyst for preparing alkali-activated binders: an opportunity for a high-degree. 14th International conference on Non-Conventional Materials and Technologies (NOCMAT 2013), 24-27 marzo, Joao Pessoa, Brasil.
9. *Presentación oral*. Mendez, R.; Borrachero, M.V.; Payá, J.; Soriano, L.; Tashima, M.M.; Monzó, J. Lime-Rice Husk ash-Portland Cement binders for mortar tiles uses. International Conference on Advances in Cement and Concrete Technology in Africa (ACCTA 2013), 30 enero, Johannesburgo, Sudafrica.



10. *Presentación oral*. Eiras, J.N.; Payá, J.; Borrachero, M.V.; Monzó, J.; Bouzón, N.; Soriano, L.; Fita, I; Cruz, J.M. Evaluación de la actividad puzolanica de una ceniza volante a partir de medidas físicas y mecánicas. XIII Congreso Nacional de Propiedades Mecánicas de Sólidos (PMS 2012), 26-28 septiembre, Alcoy, España.

### **C.3. Research projects**

1. RTI2018-097612-B-C21-AR. Nuevos retos en cementos activados alcalinamente: sostenibilidad y evaluación ambiental, Agencia Estatal de Investigación. IP: José María Monzó, Universitat Politècnica de València. 15/11/19 a 31/12/21. 101.640,00 euros. Participation as research team.
2. R-ORG-201943181. For conservation and a new use study for Fernando Moreno Barbera's Paraninfo at the University Laboral de Cheste in Spain. The Jean Paul Getty Trust. IP. Carmen Jordá Such, Universitat Politècnica de València. 03/06/19. 170.000,00 euros. Participation as research team
3. BIA2017-87573-C2-1-P-AR. Desarrollo y aplicación de ensayos no destructivos basados en ondas mecánicas para la evaluación y monitorización de reología y autosanación en materiales cementantes, Agencia Estatal de Investigación. IP: Jordi Payá, Universitat Politècnica de València. 01/01/19 a 14/11/19. 114.950,00 euros. Participation as research team
4. AD1708. Reutilización de residuos agrícolas e industriales para la fabricación de conglomerantes sostenibles en países en desarrollo. Universitat Politècnica de València. IP: María Victoria Borrachero Rosado. 14/09/2018-01/01/2020. 10.000,00 euros
5. BIA2015-70107-R. Aplicaciones de sistemas geopoliméricos obtenidos a partir de mezclas de residuos: morteros, hormigones y estabilización de suelos, Ministerio de Economía y Empresa. IP: José María Monzó, Universitat Politècnica de València. 01/11/16 a 31/12/18. 123.420,00 euros. Participation as research team.
6. BIA 2014-55311-C2-1-P. Nuevas aplicaciones de ensayos no destructivos basados en ondas mecánicas para la evaluación de la degradación en materiales cementantes. Ministerio de Economía y Empresa. IP: Jordi Payá, Universitat Politècnica de València. 01/01/2015-2017. 136.730,00 euros. Participation as research team.
7. BIA2011-26947. Reutilización de residuos cerámicos y de demolición en la preparación de materiales geopoliméricos, Ministerio de Economía y Empresa. IP: María Victoria Borrachero, Universitat Politècnica de València. 01/07/14 a 31/12/14. 162.745,00 euros.
8. BIA2010-19933. Estudio del comportamiento no lineal de ondas mecánicas para la caracterización de materiales basados en cemento y su durabilidad, Ministerio de Economía y Empresa. IP: Jordi Payá, Universitat Politècnica de València. 01/01/11 a 01/07/14. 151.008,00 euros Participation as research team.
9. PHB2011-0016-PC. Nuevos conglomerantes basados en la activación alcalina de cenizas de bagazo y de hoja de caña de azúcar. Ministerio de Educación. IP: Jordi Payá, Universitat Politècnica de València. 01/01/2012 a...13.250,00 euros. Participation as research team

### **C.4. Contracts, technological or transfer merits**

1. CENIT 2010. Desarrollo de una nueva tecnología de regeneración autónoma e inteligente de materiales (TRAINER), Construcciones y estudios, S.A. IP: Jordi Payá, Universitat Politècnica de València. 01/10/10 a 01/01/13. 140.000,00 euros. Participación como investigador participante.