***IMPORTANT** – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.*

CV date	25-01-2023

Part A. PERSONAL INFORMATION

First name	Beñat		
Family name	Pereda Ayo		
Gender (*)	Male	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	benat.pereda@ehu.eus	URL Web: https://www.tqsa.es/	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-1832-1334 A-4833-2015	

(*) Mandatory

A.1. Current position

Position	Associate Professor (Profesor Titular de Universidad)		
Initial date	22/11/2022		
Institution	University of the Basque Country, UPV/EHU		
Department/Center	Chemical Engineering	Faculty of Science and Technology	
Country	Spain	Telephone numbers	946012263 605763521
Key words	CO_2, capture, methanation, catalyst, dual function material, NO_x, NO_x Storage/Reduction, Selective Catalytic Reduction		

A.2. Previous positions (research activity interuptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
01/07/2007-30/06/2011	Predoctoral researcher, UPV/EHU
01/07/2011-09/10/2013	Postdoctoral researcher, UPV/EHU
10/10/2013-18/10/2019	Assistant Professor, UPV/EHU (Profesor Adjunto)
19/10/2019-21/11/2022	Associate Professor, UPV/EHU (Profesor Agregado)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Chemical Engineer	University of the Basque Country, UPV/EHU	2006
Master's Degree in Chemical Process Engineering and Sustainable Development	University of the Basque Country, UPV/EHU	2007
PhD in Chemical Process Engineering and Sustainable Development	University of the Basque Country, UPV/EHU	2012

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

Chemical Engineer by the University of The Basque Country (UPV/EHU, 2006) and Master's degree in Chemical Process Engineering and Sustainable Development (UPV/EHU, 2007). I did a training stay in the CenTACat of Queen´s University of Belfast for 4 months during my PhD, where I specialized in the utilization of isotope labelling techniques for the study of the reaction mechanism. International PhD in Chemical Engineering (UPV/EHU, 2012) awarded with Extraordinary Doctorate Prize and the award of the best PhD thesis of the Spanish Catalysis Society in 2013.

During the PhD and first years of my postdoctoral position I did research mainly focused on $DeNO_x$ technologies. Specifically, my PhD thesis was focused on NO_x storage and reduction (NSR) technology that combines NO_x adsorption with reaction assisted desorption and conversion to N_2. This period allowed me developing research skills on catalyst design

combining noble metals (Pt, Pd) and basic components (Ba). Besides, I learnt about dynamic catalytic processes, which combine alternate feedings and studied the reaction mechanism by advances techniques, such as isotope labeling. I also developed monolithic catalysts which are crucial for environmental applications.

During my postdoctoral period, I moved to Selective Catalytic Reduction (SCR) of NO_x. I developed research skills on the synthesis of small pore size zeolites, such as SAPO-34, and the incorporation of transition metals, such as Cu or Fe by ion-exchange. Besides, I introduced to the coupling of reactors working in series, i.e. NSR and downstream SCR.

From 2016 up to now, I have enlarged my research topics working on CO_2 capture and conversion (CCU) technologies. The previous scientific background has allowed me developing dual function materials (DFM) that combine active metals and adsorption components, as occurs in NSR technology. Besides, I got involved in reactor design assisted by process modeling and simulation. I am able to program detailed scripts to model fix bed reactors, considering mass and energy transport in axial or radial axis and also transport resistances between gas and solid phases.

I have contributed to the dissemination of results in all the previous catalytic technologies. I have actively participated in the scientific writing of articles and I have shared relevant results in international congresses. Overall, I am co-author of 62 indexed publications: 23 on NSR topic, 13 on SCR, 20 on CCU and 6 on related topics of the research group (TQSA) I belong. The papers have been published in relevant Journals of the Chemical Engineering area, such as Applied Catalysis B (12 papers) or Catalysis Today (13). I regularly attend chemical engineering and catalysis conferences, having contributed with more than 100 works, around 60% in international events. I have stablished active collaborations with international researchers with whom I share research outputs: Robbie Burch (Queen´s University Belfast), Louise Olsson (Chalmers University of Technology) or Philippe Vernoux (IRCE Lyon).

I have participated in 18 research projects. In the last two research projects devoted to CO_2 capture and utilization (CTQ2015-67597C1 and PID2019-105960RB-C1) I have been part of the research team, being responsible of several specific objectives, specifically those related to DFMs. I have also participated in the coordination of the project along with the PIs and I have been involved in the financial management of the project. I am also taking part in a proof of concept project (PDC2022133839-C21) which aims to scale up the CO_2 capture and conversion to CH_4 using DFMs. The goal is to obtain a carbon neutral energy vector (CH_4) to reduce GHG emissions and limit climate change.

I have enthusiastically participated in the formation of young researchers, transmitting different competences, such as scientific analysis, critical auto evaluation or team-working. Besides, I have participated in several workshops of the Spanish Catalysis Society, in which I presented the keys for the scientific writing to predoctoral researchers. I have supervised 26 final projects and 6 master projects. I have supervised 4 doctoral thesis in the following topics: 1 (NSR), 1 (SCR), 1 (NSR+SCR), 1 (CCU). Thus, I am able to accompany the student in the development of their scientific skills to obtain their PhDs.

I have participated in several organizing and evaluating committees. I have been part of the organizing committee of the Spanish Catalysis Society Young Researchers Congress on 2014 and 2016 and part of the scientific committee on 2014-16-18-20 and 22. I am a regular collaborator of the State Research Agency. For example, I have participated in the evaluation committee of Juan De La Cierva (2020) and Ramon y Cajal (2021) fellowships. Also, I have been evaluator of research projects of different calls. I am also regular reviewer of international scientific journals.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications *(see instructions)*

1. A. Quindimil, U. De La Torre, **B. Pereda-Ayo**, A. Davó-Quiñonero, E. Bailón-García, D. Lozano-Castelló, J.A. González-Marcos, A. Bueno-López, J.R. González-Velasco. Effect of metal loading on the CO_2 methanation: A comparison between alumina supported Ni and Ru catalysts. Catalysis Today 356 (2020) 419-432. Citations: 54

2. A. Bermejo-López, **B. Pereda-Ayo**, J.A. González-Marcos, J.R. González-Velasco. Ni loading effects on dual function materials for capture and in-situ conversion of CO_2 to CH_4 using CaO or Na_2CO_3. Journal of CO_2 utilization 34 (2019) 576-587. Citations: 56
3. A. Bermejo-López, **B. Pereda-Ayo**, J.A. González-Marcos, J.R. González-Velasco. Mechanism of the CO_2 storage and in situ hydrogenation to CH_4. Temperature and adsorbent loading effects over Ru-CaO/Al_2O_3 and Ru-Na_2CO_3/Al_2O_3 catalysts. Applied Catalysis B: Environmental 256 (2019) 117845. Citations: 53
4. A. Quindimil, U. De La Torre, **B. Pereda-Ayo**, J.A. González-Marcos, J.R. González-Velasco. Ni catalysts with La as promoter supported over Y- and BETA- zeolites for CO_2 methanation. Applied Catalysis B: Environmental 238 (2018) 393-403. Citations: 130
5. J.A. Onrubia-Calvo, **B. Pereda-Ayo**, U. De La Torre, J.R. González-Velasco. Key factors in Sr-doped $LaBO_3$ (B = Co or Mn) perovskites for NO oxidation in efficient diesel exhaust purification. Applied Catalysis B: Environmental 213 (2017) 198-210. Citations: 110
6. U. De La Torre, **B. Pereda-Ayo**, M. Moliner, J.R. González-Velasco, A. Corma. Cu-zeolite catalysts for NO_x removal by selective catalytic reduction with NH_3 and coupled to NO_x storage/reduction monolith in diesel engine exhaust aftertreatment systems. Applied Catalysis B: Environmental 187 (2016) 419-427. Citations: 66
7. **B. Pereda-Ayo**, U. De la Torre, M.P. González-Marcos, J.R. González-Velasco. Influence of ceria loading on the NO_x storage and reduction behavior of model Pt-Ba/Al_2O_3 NSR catalyst. Catalysis Today 241 (2015) 133-142. Citations: 39
8. **B. Pereda-Ayo**, U. De la Torre, J.R. González-Velasco, M.J. Illán-Gómez, A. Bueno. Role of the different copper species on the activity of Cu/zeolite catalysts for SCR of NO_x with NH_3. Applied Catalysis B: Environmental 147 (2014) 420-428. Citations: 153
9. U. De La Torre, **B. Pereda-Ayo**, J. R. González-Velasco. Cu-zeolite NH_3-SCR catalysts for NOx removal in the combined NSR–SCR technology. Chemical Engineering Journal 207 (2012) 10-18. Citations: 57
10. **B. Pereda-Ayo**, J.R. González Velasco, R. Burch, C. Hardacre, S. Chansai. Regeneration mechanism of a Lean NO_x Trap (LNT) catalyst in the presence of NO investigated using isotope labelling techniques. Journal of Catalysis 285 (2012) 177-186. Citations: 32

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

1. J.R. González-Velasco, A. Bermejo-López, J.A. Onrubia-Calvo, **B. Pereda-Ayo**, J.A. González-Marcos. Dual function materials for integrated CO_2 capture and conversion towards synthetic natural gas. French Conference on Catalysis. 30/05/2022-03/06/2022, Ronce-les-Bains, France. Invited Conference. Role: co-author.
2. **B. Pereda-Ayo**. Escritura científica: elaboración y revisión de artículos científicos. IV Encuentro de Jóvenes Investigadores de la SECAT. 21/09/2020-23/09/2020, Bilbao. Invited conference. Role: speaker.
3. A. Bermejo-López, **B. Pereda-Ayo**, J.A. González-Marcos, J.R. González-Velasco. Optimización mediante simulación de la captura de CO_2 y metanación in situ sobre el catalizador dual 4Ru10Na_2CO_3/Al_2O_3. Congreso Iberoamericano de Catálisis (CICAT 2020). 26/10/2020-28/10/2020. Online, Puerto Vallarta, México. Oral communication. Rol: co-author.
4. M. Urrutxua, **B. Pereda**, U. De La Torre, J.R. González. Identificación de especies adsorbidas sobre el catalizador Cu/SAPO-34 durante la reacción NH_3-SCR. Congreso de la Sociedad Española de Catálisis (SECAT'17). 26/06/2017-28/06/2017, Oviedo. Oral communication. Rol: speaker.
5. **B. Pereda-Ayo**, J.A. Onrubia, U. De la Torre, J.R. González-Velasco. La-based perovskites as partial substitutive of Pt-Ba/Al_2O_3 catalysts for NO_x storage and reduction. The 16th International Congress on Catalysis. 3/07/2016-8/07/2016, Beijing, China. Poster. Rol: presenter.
6. U. De La Torre, **B. Pereda-Ayo**, J.R. González-Velasco, M. Moliner, A. Corma. Thermal aging resistance of Cu-zeolite based catalysts on NH_3-SCR for lean burn engines exhaust

control. XIIth European Congress on Catalysis (EUROPACAT'15). 30/08/2015-04/09/2015, Kazan, Rusia. Oral communication. Rol: speaker.

7. **B. Pereda-Ayo**, Rubén López-Fonseca, J.R. González-Velasco. Almacenamiento y reducción de NO_x (NSR) para motores diésel: Síntesis del catalizador monolítico Pt-Ba/Al_2O_3, mecanismos de reacción y control óptimo del proceso. Congreso de la Sociedad Española de Catálisis (SECAT'13). 26/06/2013-28/06/2013, Sevilla. Invited conference. Rol: speaker.
8. **B. Pereda-Ayo**, E.J. Juárez-Pérez, M.P. González-Marcos, J.R. González-Velasco. Influence of the incorporation of ceria to the model Pt-Ba/Al_2O_3 NO_x Storage Reduction (NSR) catalyst. XIth European Congress on Catalysis (EUROPACAT'13). 01/09/2013-06/09/2013, Lyon, France. Oral communication. Rol: speaker.

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1. Escalado de la tecnología de captura de CO_2 y utilización hacia CH_4 usando materiales con función dual (DFM). PDC2022-133839-C21. Ministerio de Ciencia e Innovación. 115.155,00 €. 01/12/2022-30/11/2024. PI: José Antonio González Marcos and Juan Ramón González Velasco. Role: Research team responsible of specific objectives.
2. Tecnologías Químicas para la Sostenibilidad Ambiental (Research Group). IT1509-22. Basque Goverment. 353.000,00 €. 01/01/2022-31/12/2025. PI: Miguel Ángel Gutiérrez Ortíz. Role: Researcher.
3. Planta piloto para el escalado de procesos con requerimiento de gestión de calor. INF21/15. Universidad del País Vasco/Euskal Herriko Unibertsitatea. 39.235,00 €. 01/01/2021-31/12/2021. PI: Juan Ramón González Velasco. Role: Researcher.
4. Integración de procesos en la metanación de CO_2: Catalizadores y materiales con doble función, diseño del reactor y estrategias operacionales. PID2019-105960RB-C21 Ministerio de Ciencia e Innovación. 267.410,00 €. 01/01/2020-31/12/2022. PI: Juan Ramón González Velasco. Role: Research team responsible of specific objectives.
5. Tecnologías Químicas para la Sostenibilidad Ambiental (Research Group). IT1297-19. Basque Goverment. 367.500,00 €. 01/01/2019-31/12/2021. PI: Juan Ramón González Velasco. Role: Researcher.
6. Innovaciones en la metanación de CO_2: Materiales MDF, cinética, diseño del reactor y estrategias de operación (catalizador y proceso) para un modelo energético renovable. CTQ2015-67597-C2-1-R. Ministerio de Economía y Competitividad (MINECO). 262.570,00 €. 01/01/2016-31/12/2019. PI: Juan Ramón González Velasco. Role: Research team responsible of specific objectives.

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

1. J.A. Onrubia-Calvo, B. Pereda-Ayo, J.A. González-Marcos, J.R. González-Velasco. Solicitud de Patente española nº 202131088, por: "Catalizadores para metanación de monóxido de carbono, dióxido de carbono o mezcla de ambos". P211637ES FN00909770.
2. J.A. Onrubia-Calvo, B. Pereda-Ayo, J.A. González-Marcos, J.R. González-Velasco. Solicitud de Patente Europea nº 22208940.1, proveniente de la Patente española nº 202131088, por: "Catalizadores para metanación de monóxido de carbono, dióxido de carbono o mezcla de ambos ". P223325EP.
3. Contract with the Department of economic development, sustainability and environment of the Basque Government. El studio y avance en el conocimiento de procesos de contaminación atmosférica en euskadi. 200.000,00 €. 04/11/2022-03/11/2026. Role: Researcher.