List of Publications

[1] F. Bager, **N. López-Salas**, S. Ernst, Improved propene yields from catalytic cracking: The potential of medium-pore zeolites as additives, *Oil Gas European Magazine* 38(2) (2012) 107-111.

[2] **N. López-Salas**, F. Del Monte, A. Tamayo, J.L.G. Fierro, A.L. De Lacey, M.L. Ferrer, M.C. Gutiérrez, Sulfur-doped carbons prepared from eutectic mixtures containing hydroxymethylthiophene as metal-free oxygen reduction catalysts, *ChemSusChem* 7(12) (2014) 3347-3355.

[3] **N. López-Salas**, M.C. Gutiérrez, C.O. Ania, J.L.G. Fierro, M.L. Ferrer, F. Del Monte, Efficient nitrogen-doping and structural control of hierarchical carbons using unconventional precursors in the form of deep eutectic solvents, *Journal of Materials Chemistry A* 2(41) (2014) 17387-17399.

[4] **N. López-Salas**, E.O. Jardim, A. Silvestre-Albero, M.C. Gutiérrez, M.L. Ferrer, F. Rodríguez-Reinoso, J. Silvestre-Albero, F. Del Monte, Use of eutectic mixtures for preparation of monolithic carbons with CO_2-adsorption and gas-separation capabilities, *Langmuir* 30(41) (2014) 12220-12228.

[5] **N. López-Salas**, D. Carriazo, M.C. Gutiérrez, M.L. Ferrer, C.O. Ania, F. Rubio, A. Tamayo, J.L.G. Fierro, F. Del Monte, Tailoring the textural properties of hierarchical porous carbons using deep eutectic solvents, *Journal of Materials Chemistry A* 4(23) (2016) 9146-9159.

[6] **N. López-Salas**, M.C. Gutiérrez, C.O. Ania, M.A. Muñoz-Márquez, M. Luisa Ferrer, F.D. Monte, Nitrogen-doped carbons prepared from eutectic mixtures as metal-free oxygen reduction catalysts, *Journal of Materials Chemistry A* 4(2) (2016) 478-488.

[7] J. Patiño, **N. López-Salas**, M.C. Gutiérrez, D. Carriazo, M.L. Ferrer, F. Del Monte, Phosphorus-doped carbon-carbon nanotube hierarchical monoliths as true three-dimensional electrodes in supercapacitor cells, *Journal of Materials Chemistry A* 4(4) (2016) 1251-1263.

[8] E. Posada, **N. López-Salas**, D. Carriazo, M.A. Muñoz-Márquez, C.O. Ania, R.J. Jiménez-Riobóo, M.C. Gutiérrez, M.L. Ferrer, F.D. Monte, Predicting the suitability of aqueous solutions of deep eutectic solvents for preparation of co-continuous porous carbons via spinodal decomposition processes, *Carbon* 123 (2017) 536-547.

[9] E. Posada, **N. López-Salas**, R.J. Jiménez Riobóo, M.L. Ferrer, M.C. Gutiérrez, F. Del Monte, Reline aqueous solutions behaving as liquid mixtures of H-bonded co-solvents: Microphase segregation and formation of co-continuous structures as indicated by Brillouin and ^{1}H NMR spectroscopies, *Physical Chemistry Chemical Physics* 19(26) (2017) 17103-17110.

[10] **N. López-Salas**, M.L. Ferrer, M.C. Gutiérrez, J.L.G. Fierro, C. Cuadrado-Collados, J. Gandara-Loe, J. Silvestre-Albero, F. del Monte, Hydrogen-bond supramolecular hydrogels as efficient precursors in the preparation of freestanding 3D carbonaceous architectures containing BCNO nanocrystals and exhibiting a high CO_2/CH_4 adsorption ratio, *Carbon* 134 (2018) 470-479.

[11] M. Antonietti, **N. López-Salas**, A. Primo, Adjusting the Structure and Electronic Properties of Carbons for Metal-Free Carbocatalysis of Organic Transformations, *Advanced Materials* 31(13) (2019), 1805719.

[12] C. Castillo-Blas, **N. López-Salas**, M.C. Gutiérrez, I. Puente-Orench, E. Gutiérrez-Puebla, M.L. Ferrer, M.Á. Monge, F. Gándara, Encoding Metal-Cation Arrangements in Metal-Organic Frameworks for Programming the Composition of Electrocatalytically Active Multimetal Oxides, *Journal of the American Chemical Society* 141(4) (2019) 1766-1774.

[13] **N. López-Salas***, J.M. Vicent-Luna, S. Imberti, E. Posada, M.J. Roldán, J.A. Anta, S.R.G. Balestra, R.M. Madero Castro, S. Calero, R.J. Jiménez-Riobóo, M.C. Gutiérrez, M.L. Ferrer, F. Del Monte, Looking at the "water-in-Deep-Eutectic-Solvent" System: A Dilution Range for High Performance Eutectics, *ACS Sustainable Chemistry and Engineering* 7(21) (2019) 17565-17573.

[14] R.J. Sánchez-Leija, **N. López-Salas**, J.L.G. Fierro, M.C. Gutiérrez, M.L. Ferrer, J.D. Mota-Morales, G. Luna-Bárcenas, F.D. Monte, Deep eutectic solvents as active media for the preparation of highly conducting 3D free-standing PANI xerogels and their derived N-doped and N,P-codoped porous carbons, *Carbon* 146 (2019) 813-826.

[15] J. Kossmann, T. Heil, M. Antonietti, **N. López-Salas***, Guanine-Derived Porous Carbonaceous Materials: Towards C_1N_1, *ChemSusChem* 13(24) (2020) 6643-6650.

[16] J. Lee, G. Hussain, **N. López-Salas**, D.R. Macfarlane, D.S. Silvester, Thin films of poly(vinylidene fluoride-: Co -hexafluoropropylene)-ionic liquid mixtures as amperometric gas sensing materials for oxygen and ammonia, *Analyst* 145(5) (2020) 1915-1924.

[17] **N. López-Salas***, J.M. Vicent-Luna, E. Posada, S. Imberti, R.M. Madero-Castro, S. Calero, C.O. Ania, R.J. Jiménez-Rioboó, M.C. Gutiérrez, M.L. Ferrer, F. Del Monte*, Further Extending the Dilution Range of the "solvent-in-DES" Regime upon the Replacement of Water by an Organic Solvent with Hydrogen Bond Capabilities, *ACS Sustainable Chemistry and Engineering* 8(32) (2020) 12120-12131.

[18] Z. Tian, **N. López-Salas**, C. Liu, T. Liu, M. Antonietti, C_2N: A Class of Covalent Frameworks with Unique Properties, *Advanced Science* 7(24) (2020), 2001767.

[19] **N. López-Salas**, J. Kossmann, M. Antonietti, Rediscovering Forgotten Members of the Graphene Family, Accounts Materials Research 1 (2) (2020) 117–122.

[20] J. Kossmann, D. Piankova, N.V. Tarakina, J. Heske, T.D. Kühne, J. Schmidt, M. Antonietti, **N. López-Salas***, Guanine condensates as covalent materials and the concept of cryptopores, *Carbon* 172 (2021) 497-505.

[21] H. Wang, S. Delacroix, O. Osswald, M. Anderson, T. Heil, E. Lepre, **N. López-Salas**, R.B. Kaner, B. Smarsly, V. Strauss, Laser-carbonization: Peering into the formation of micro-thermally produced (N-doped)carbons, *Carbon* 176 (2021) 500-510.

[22] I.K. Ilic, E. Lepre, **N. López-Salas***, Caffeine-Derived Noble Carbons as Ball Milling-Resistant Cathode Materials for Lithium-Ion Capacitors, *ACS Applied Materials & Interfaces* (2021) https://pubs.acs.org/doi/10.1021/acsami.1c06013.

[23] J. Kossmann, R. Rothe, T. Heil, M. Antonietti, **N. López-Salas***, Ultrahigh water sorption on highly nitrogen-doped carbonaceous materials derived from uric acid, *Journal of Colloid and Interface Science* 602 (2021) 880-888.

[24] A. Rodriguez-Gomez, E. Lepre, L. Sánchez-Silva, **N. López-Salas**, A. R. de la Osa, PtRu nanoparticles supported on noble carbons for ethanol electrooxidation, *Journal of Energy Chemistry*, (2022). 66, 168-180.

[25] M. A. R. da Silva, Q. Xue, B. T. W. Lo, N. V. Tarakina, B. N. Nunes, S. K. Sahoo, Detlef W. Bahnemann, **N. López Salas**, A. Savateev, C. Ribeiro, T. D. Kühne, M. Antonietti, and I. F. Teixeira* "Sustainable oxidation catalysis supported by light: Fe-poly (heptazine imide) as a heterogeneous single-atom photocatalyst", *Applied Catalysis B: Environmental* (2022) 304, 120965.

[26] I. F. Teixeira*, N. V. Tarakina, I. F. Silva, **Nieves López-Salas**, A. Savateev, M. Antonietti, "Overcoming Electron Transfer Efficiency Bottlenecks for Hydrogen Production in Highly Crystalline Carbon Nitride-Based Materials" *Advanced Sustainable Systems* (2022), 2100429.

[27] J. Kossmann, M. L. O. Sánchez-Manjavacas, H. Zschiesche, N. V. Tarakina, M. Antonietti, J. Albero* and **N. López-Salas***, "CuII/CuI decorated N-doped carbonaceous electrocatalysts for the oxygen reduction reaction" ", *Journal of Materials Chemistry A* (10 (11) (2021) 6107-6114.

[28] **N. López-Salas*** and J. Albero*, "CxNy: New Carbon Nitride Organic Photocatalysts" F*rontiers in Materials* (2021), 10.3389/fmats.2021.772200.

[29] **N. López-Salas** and M. Antonietti* "Carbonaceous Materials: The Beauty of Simplicity", *Bulletin of the Chemical Society of Japan* (2021), 94, 2822–2828.

[30] E. Lepre, J. Heske, M. Nowakowski, E. Scoppola, I. Zizak, T. Heil, T. D. Kühne, M. Antonietti, **N. López-Salas***, Josep Albero*, "Ni-Based Electrocatalysts for Unconventional CO_2 Reduction Reaction to Formic Acid", *Nano Enery* (2022), 97, 107191.

[31] J. Kossmann, M. L. O. Sánchez-Manjavacas, J. Brandt, T. Heil, **N. López-Salas*** and J. Albero* "Mn(II) sub-nanometric sites stabilization in noble, N-doped carbonaceous materials for electrochemical CO_2 reduction", *Chemical Communications* (2022), 58, 4841 - 4844.

[32] M. Jerigova, M. Odziomek, **N. López-Salas***, "We are Here! Oxygen Functional Groups in Carbons for Electrochemical Applications", *ACS Omega* (2022), 7, 14, 11544–11554.

[33] Z. Tian, Q. Zhang, L. Thomson, N. Gao, J. Pan, R. Daiyan, J. Yun, J. Brandt, **N. López-Salas**, F. Lai, Q Li, T. Liu, R. Amal*, X. Lu*, Markus Antonietti*, "Constructing Interfacial Boron-nitrogen Moieties in Turbostratic Carbon for Electrochemical Hydrogen Peroxide Production", *Angewandte Chemie International Ed*ition (2022), 61, e202206915.

[34] M. Odziomek, P. Giusto, J. Kossmann, Nadezda V. Tarakina, J. Heske, S. M. Rivadeneira, T. D. Kuhne, W. Keil, C. Schmidt, S. Mazzanti, A. Savateev, M. Antonietti, **N. López-Salas***, "Red carbon": A rediscovered polymeric, crystalline semiconductor", *Advanced Materials* (2022), 32, 2206405.

[35] I. Silva, N. Tarakina, G. A. Diab, **N. López-Salas**, A. Svaatev, M. Antonietti, I. Texeira, "Improving Hydrogen Production for Carbon-Nitride-Based Materials: Crystallinity, Cyanimide Groups and Alkali Metals in Solution Working Synergistically *Journal of Materials Chemistry A* (2022), *10,* 18156-18161.

[36] B. S. Lammers, **N. López-Salas**, J. S. Siena, H. Mirhosseini, D. Yesilpinar, J. Heske, T. D. Kühne, H. Fuchs, M. Antonietti, H. Mönig, "Real-space identification of non-noble single atomic catalytic sites within metal-coordinated supramolecular networks", *ACS Nano* (2022), *16, 9, 14284–14296*.

[37] H. Wang, M. Jerigova, J. Hou, N. V. Tarakina, S. Delacroix**, N. López-Salas***, V. Strauss*, "Modulating between 2e- and 4e- pathway in the oxygen reduction reaction with laser-synthesized iron oxide-grafted nitrogen-doped carbon", *Journal of Materials Chemistry A* (2022), 10, 24156-24166. *DOI: 10.1039/D2TA05838C*.

[38] M. Jerigova, J. Heske, T. D. Kühne, Z. Tian, M. Tovar, M. Odziomek, **N. Lopez-Salas***, "C_1N_1 thin films from guanine decomposition fragments" Advanced Materials Interfaces (2023) 10, 2202061., DOI: 10.1002/admi.202202061.

[39] D. V. Piankova, J. Kossmann, H. Zschiesche, M. Antonietti, **N. López-Salas,** N. V. Tarakina*, "Following carbon condensation by in-situ TEM: Towards a rational understanding of the processes in the synthesis of nitrogen-doped carbonaceous materials", *Journal of Materials Chemistry A (2022),* **10**, 25220-25229. *DOI: 10.1039/D2TA05247D*.

[40] E. Lepre, S. Rat, C. Cavedon, P. H. Seeberger, B. Pieber, M. Antonietti, **Nieves López-Salas***, "Catalytic properties of high nitrogen content carbonaceous materials" Angewandte Chemie International Edition (2023), 135, e202211663. DOI: 10.1002/anie.202211663.

[41] A. Rodríguez-Gómez, E. Lepre, F. Dorado, M. L. Sanchez, **N. López-Salas**, A. R. de la Osa*, "Efficient ethanol electro-reforming on bimetallic anodes supported on Adenine-based Noble Carbons: hydrogen production and value-added chemicals", *Materials Today Energy* (2023), 32, 101231. DOI. 10.1016/j.mtener.2022.101231.

[42] M. Jerigova, Y. Markushyna, I. F. Teixeira, B. Badamdor, M. Isaacs, D. Cruz, I. Lauermann, M. Á. Muñoz-Márquez, N. V. Tarakina, **N. López-Salas**, O. Savateev, P. Jimenéz-Calvo* "Green Light Photoelectrocatalysis with Sulfur-Doped Carbon Nitride: Using Triazole-Purpald for Enhanced Benzylamine Oxidation and Oxygen Evolution Reactions", Advanced Science (2023) 10, 2300099. DOI: 10.1002/advs.202300099.

[43] C. Li, E. Lepre, M. Bi, M. Antonietti, J. Zhu, Y. Fu*, **N. López-Salas***, "Oxygen-Rich Carbon Nitrides from an Eutectic Template Strategy Stabilize Ni, Fe Nanosites for Electrocatalytic Oxygen Evolution", Advanced Science (2023), 2300526. https://doi.org/10.1002/advs.202300526

[44] J. Li, J. Kossmann, K. Zeng, K. Zhang, B. Wang, C. Weinberger, M. Antonietti, M. Odziomek, **N. López-Salas*** "When High-Temperature Cesium Chemistry Meets Self-Templating: Metal Acetates as Building Blocks of Unusual Highly Porous Carbons", *Angewandte Chemie International Ed*ition (2023) e202217808. DOI: 10.1002/anie.202217808.

[45] C. Li, Z. Song, M. Liu, E. Lepre, M. Antonietti, J. Zhu, J. Liu, Y. Fu, **N. López-Salas*** "Template-Induced Graphitic Nanodomains in Nitrogen-Doped Carbons Enable High-Performance Sodium-Ion Capacitors" *Energy Environ. Mater., 7: e12695.*

[46] X. Zheng, Z. Tian, R. Bouchal, M. Antonietti, **N. López-Salas**, M. Odziomek* "Tin (II) Chloride Salt Melts as Non-Innocent Solvents for the Synthesis of Low-Temperature Nanoporous Oxo-Carbons for Nitrate Electrochemical Hydrogenation" Advanced Materials (2023), 2311575.

[47] X. He, H. Wu, M. Chen, J. Lv, H. Xiao, **N. López Salas**, B. Wu, P. Liu, K. Zeng*, G. Yang* "Improve the Crosslinking Reactivity of Nitrile: Design of Nitrile-Functionalized Pyrazine and its Hydrogen Bond-Assisted Nucleophilic Enhancement Study" *Macromol. Rapid Commun.* (2023) 44, 2300199.

[48] S. R.E. Mohamed, A. S.A. Mohammed, O. I. Metwalli, S. El-Sayed, G. Khabiri, A. Hassan, K. Yin, S. O. Abdellatif**, N. López-Salas**, A. S. G. Khalil, "Synergistic design of high-performance symmetric supercapacitor based on iron oxide nanoplatelets/COOH-MWCNTs heterostructures: DFT computation and experimental analysis" *J. Alloys Compd*. (2024) 987, 174118.

[49] R. F. André, J. Brandt, J. Schmidt, **N. López-Salas**, M. Odziomek, M. Antonietti, "Inductively coupled plasma spectroscopy for heteroatom-doped carbonaceous materials: Limitations and acid choice for digestion", Carbon (2024) 223, 118946.

[50] R André, C. Gervais, H. Zschiesche, T. Jianu, **N. López-Salas**, M. Antonietti, M. Odziomek, "Revisiting the phosphonium salts chemistry for P-doped carbons synthesis: toward high phosphorus contents and beyond the phosphate environment", Mater. Horiz., 2024,11, 3437.

[51] W. O. Makinde, M. A. Hassan, Y. Pan, G. Guan, **N. López-Salas**, A. S. G. Khalil* "Sulfur and Nitrogen Co-doping of Peanut Shell-derived Biochar for Sustainable Supercapacitor Applications" *J. Alloys Compd*. (2024) 991, 174452.

[52] I. Lamata-Bermejo, W. Keil, K. Nolkemper, J. Heske, J. Kossmann, H. Elgabarty, M. Wortmann, C. Schmidt,* T. D. Kühne,* **N. López-Salas*** and M. Odziomek*, "Understanding the wettability of C1N1 (sub)nanopores: implications for porous carbonaceous electrodes" *Angewandte Chemie International Ed*ition (2024) *accepted manuscript*, DOI: 10.1002/anie.202411493.

[53] F. A. Kwarteng, A. A.R. Abdel-Aty, S.R.E. Mohamed, M. A. Hassan, H. Ohashi, **N. López-Salas**, W. M. Semida, A.S.G. Khalil*, "Novel onion flower-derived biochar for high-performance sustainable supercapacitor applications" *Diam. Relat. Mater*. (2024) 150, 111703, DOI. 10.1016/j.diamond.2024.111703

[54] V. B. N. Eloundou, P. K. Tsobnang*, T. Kamgaing, C. Gogoi, **N. López-Salas**, S. A. Bourne "Crystal engineering and sorption studies on CN- and dipyridyl-bridged 2D coordination polymers" *Cryst. Eng. Comm.*, 2024, 26, 4195-4204. DOI: 10.1039/D4CE00459K.

[55] I. A. Lázaro, A. Anastasaki, H. A. M. Ardoña, M. Q. Arguilla, A. S.R. Bati, M. Batmunkh, Q. A. Besford, M. P. Browne, S. J. Bryant, M. Carlotti, C. Contini, C. Delaney, E. R. Draper, A. Elbourne, J. D. Evans, L. Florea, A. Forner-Cuenca, A. C. Forse, M. I. Gonzalez, S. Krause, H. K. Lee, M. M. Lerch, S. Liu, **N. López-Salas**, F. J. Martin-Martinez, C. Pezzato, L. Protesescu, F. Schaufelberger, P. S. Pascual, A. Sierra Fernández, W. A. Tarpeh, G. Vilé, L. K.S. von Krbek, H. Wang, T. Wu, C. J.R. Wells, S. W. Cranford, "35 challenges in materials science being tackled by PIs under 35(ish) in 2024" *Matter* (2024) 7, 11, 3699-3706. DOI: https://doi.org/10.1016/j.matt.2024.09.026.

[56] S. Katwesigye, M. E. El-Khouly, **N. López-Salas**, Ahmed S. G. Khalil*, "Value-added utilization of biowaste-derived lignin towards the synthesis of oxygen-enriched hierarchical laser-induced graphene and its application as a micro-supercapacitor" *J. Energy Storage* 2025, 105, 114752.

[57] Dileepkumar V G, Swapna Pahra, **Nieves López-Salas***, Basavaraja B M, Afaq Ahmed Khan, Pooja Devi*, M. S. Santosh* "Enhancing NiS Performance: Na-Doping for Advanced Photocatalytic and Electrocatalytic Applications" *Nanoscale*, (2025), 17, 2682 – 2691. DOI: 10.1039/D4NR04293J.

[58] J. Hu, S. Goberna, L. Simonelli, **N. López-Salas**, H. García, J. Albero, "Fe and Sn single sites-based electrodes for high current CO_2 reduction in acid media and stable Zn-CO_2 battery" *ACS Appl. Energy Mater.* (2025) 8, 2, 1179–1188.

[59] W. O. Makinde, Mo. A. Hassan, W. M. Semida, Y. Pan, G. Guan, **N. López-Salas**, A. S. G. Khalil* "Heteroatom co-doped green pea peel-derived biochar for high-performance energy storage applications" 2024, *RSC Adv. (2025) 15, 15819-15831*.

[60] Y. Pan,* L. Liao, X. Zhang, Y. Liu, R. Su,* **N. López-Salas*** "Oxidation-enhanced piezocatalytic activity in carbon nitride-based catalysts for hydrogen and hydrogen peroxide production", (2025) *https://doi.org/10.1002/cssc.202500980*.

[61] C. Li, R. Liu, Z. Zhang, F. Zuo, T. Jiang, H. Zhang, **N. López-Salas***, B. Wang*, "Engineering Charge Polarized Au Sites for Low-Temperature Acetylene Hydrochlorination" *Angew. Chem. Int. Ed.* 2025, 64, e202501370. **https://doi.org/10.1002/anie.202501370**

[62] L. Tao*, C. Li*, X. Lu*, **N. López-Salas***, J. Liu *, Adenine and D-Ribose Coderived Activated Carbon with N-Methyl-2-Pyrrolidone-Modified Aqueous Electrolyte for Long-Life Zinc-Ion Capacitors. *Batteries & Supercaps* 2500161. https://doi.org/10.1002/batt.202500161.

[63] S. Kumari, S. Pahra, A. Tripathy, N. Sumanth, **N. López-Salas**, S. K. Tiwarid, P. Devi, M.S. Santosh, "Interfacial Engineering of CuSe2/FeSe2 Heterojunction for Water Splitting: A Pathway to High-Performance Hydrogen and Oxygen Evolution Reactions" 2025, *Nanoscale, 2025,17, 19253-19265*

[64] B. Dawai, Y. Pan*, P. Kenfack Tsobnang*, I. Tonle Kenfack, **N. López-Salas***, "Photocatalytic hydrogen peroxide production from water using a cyano-covalent organic framework" 2025, *submitted manuscript*.

The demand for sustainable chemical production methods has led to significant advancements in photocatalysis. This study explores the photocatalytic production of hydrogen peroxide (H_2O_2) from water using a covalent organic framework (CYANO-COF) synthesized from triformylphloroglucinol (Tp) and 4,4'-diamino-[1,1'-biphenyl]-3,3'-dicarbonitrile (Bp-CN) via Schiff-base condensation. The CYANO-COF exhibited a highly ordered structure with an optimal bandgap (2.22 eV) for visible-light absorption and effective charge separation. Furthermore, the photoelectrochemical characterizations revealed the photoresponsive nature of the material by creating high charge density under illumination. Under illumination, the photocatalyst demonstrated efficient H_2O_2 generation with production rates of 550 $\mu molg^{-1}h^{-1}$ using only water and 371 $\mu molg^{-1}h^{-1}$ in the presence of ethanol. The sacrificial-agent-free system aligns with green chemistry principles, simplifying reaction conditions and reducing environmental impact. Mechanistic studies confirmed the role of photoinduced electron-hole pairs in water splitting and oxygen reduction. This research underscores the potential of CYANO-COF materials in sustainable H2O2 production using only water and sunlight, thus highlighting avenues for optimizing long-term stability and efficiency.

[65] Y. Pan,* L. Liao, D. Qiao, I. Lamata Bermejo, Y. Liu, R. Su,* **N. López-Salas*** "Tin chloride metal salt modified carbon nitride for efficient hydrogen and hydrogen peroxide production from pure water via piezocatalysis", (2025) *submitted article*.

Piezocatalysis presents a sustainable and energy-efficient method for producing hydrogen (H2) and hydrogen peroxide (H2O2), utilizing mechanical energy to drive chemical reactions without the need for external power sources or harmful chemicals. In this study, we explore the modification of graphitic carbon nitride (g-C3N4) using molten salt methods to enhance

its piezoelectric properties for H2 and H2O2 production from water without any co-catalysts or sacrificial agents. A one-pot synthesis approach was used to anchor Sn-based species onto g-C3N4. During thermal pyrolysis, SnCl2 facilitated the exfoliation of the g-C3N4 layer. The oxidation of SnCl2 and its interaction with g-C3N4 promoted the formation of g-C3N4/Sn-based composites. The synergistic interaction between exfoliated, defect-rich g-C3N4 and non-piezoelectrically active Sn species leads to a significant enhancement of the piezoelectric effect compared to pristine g-C3N4. Notably, the g-C3N4/Sn-based composites achieved superior H2 (3846.46 μmol g-1 h-1) and H2O2 (999.11 μmol g-1 h-1) production rates from pure water. This work provides new insights into the structural and compositional modulation of g-C3N4 and paves the way for further piezocatalytic research using two-dimensional carbon nitride materials.