

Supporting Information

Solid-phase synthesis of graphitic carbon nanostructures from iron and cobalt gluconates and their utilization as electrocatalyst supports

*M. Sevilla,^a C. Salinas Martínez-de Lecea,^b T. Valdés-Solís,^a E. Morallón^c
and A. B. Fuertes^{* a}*

^a Instituto Nacional del Carbón (CSIC), P. O. Box 73, 33080-Oviedo, Spain

^b Departamento de Química Inorgánica. Universidad de Alicante. Apartado 99. 03080 Alicante. Spain.

^c Departamento de Química Física e Instituto Universitario de Materiales. Universidad de Alicante. Apartado 99. 03080-Alicante. Spain

^{*} **E-mail:** abefu@incar.csic.es

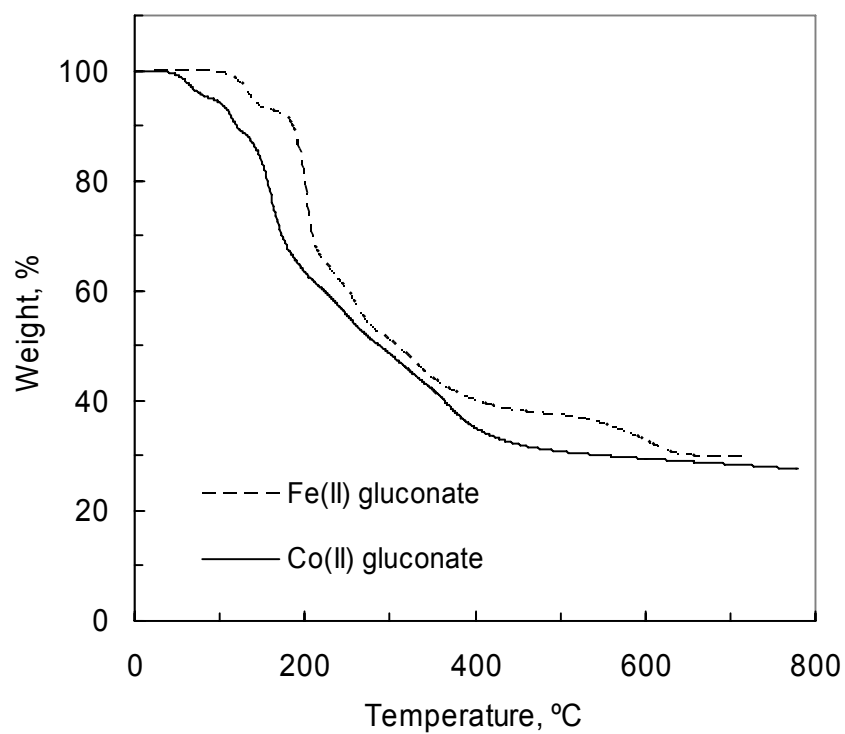


Figure S1. Thermogravimetric weight profiles for the decomposition of Fe (II) gluconate and Co (II) gluconate under nitrogen (Heating rate: 5 °C/min).

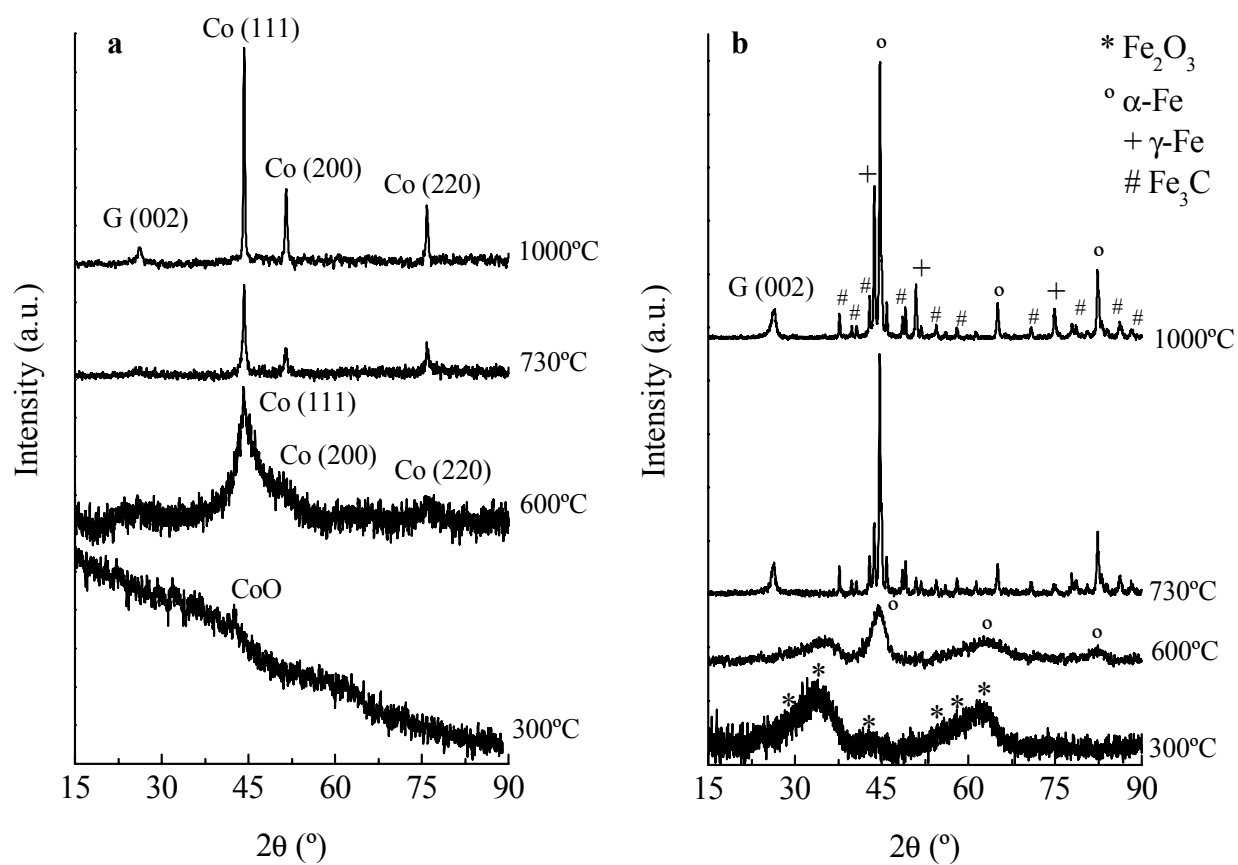


Figure S2. XRD patterns of (a) Co (II) gluconate and (b) Fe (II) gluconate carbonized at different temperatures.

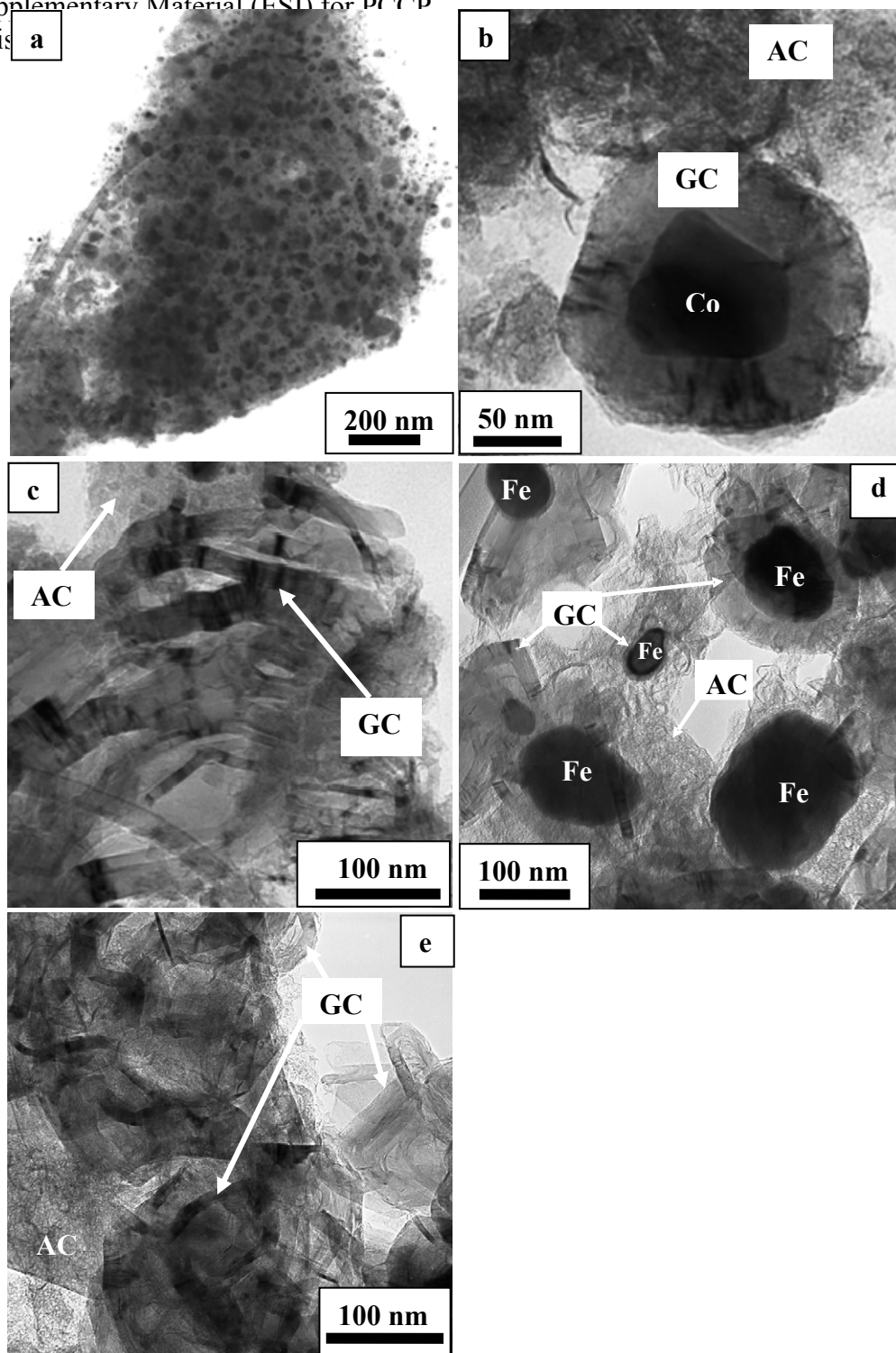


Figure S3. (a) and (b) are TEM microphotographs of Co (II) gluconate pyrolyzed at 730°C before the removal of metallic nanoparticles, and (c) is a TEM microphotograph of Co (II) gluconate pyrolyzed at 730°C after the metal removal. (d) and (e) TEM microphotographs of Fe (II) gluconate pyrolyzed at 900°C before and after the removal of metallic nanoparticles respectively. GC=Graphitic carbon, AC=Amorphous carbon. In Figures (a), (b) and (d) the dark areas correspond to the Co and Fe nanoparticles respectively.

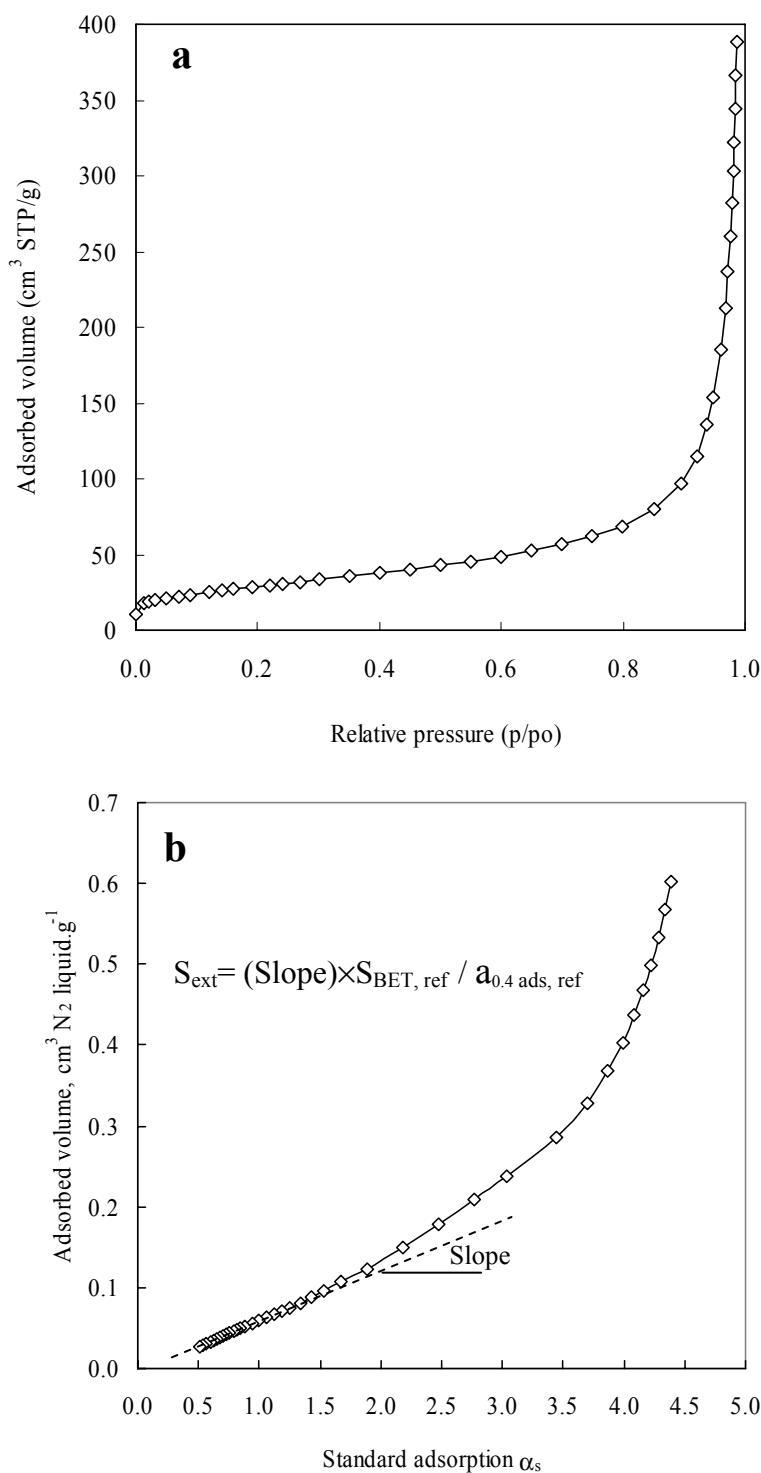


Figure S4. (a) A typical N_2 adsorption isotherm for a GCN (GGFe-900) and (b) the α_s plot obtained for the isotherm represented in (a). In (b) the method employed for the calculation of the external surface area is illustrated. $S_{\text{BET, ref}}$ is the BET surface area of the material used as reference and $a_{0.4 \text{ ads, ref}}$ is the amount of nitrogen ($\text{cm}^3 \text{ N}_2 \text{ liquid.g}^{-1}$) adsorbed by the reference solid at a relative pressure of 0.4. For details see M. Kruk, M. Jaroniec, K. P. Gadkaree, J. Colloid. Interface Sci. 192 (1997) 250.

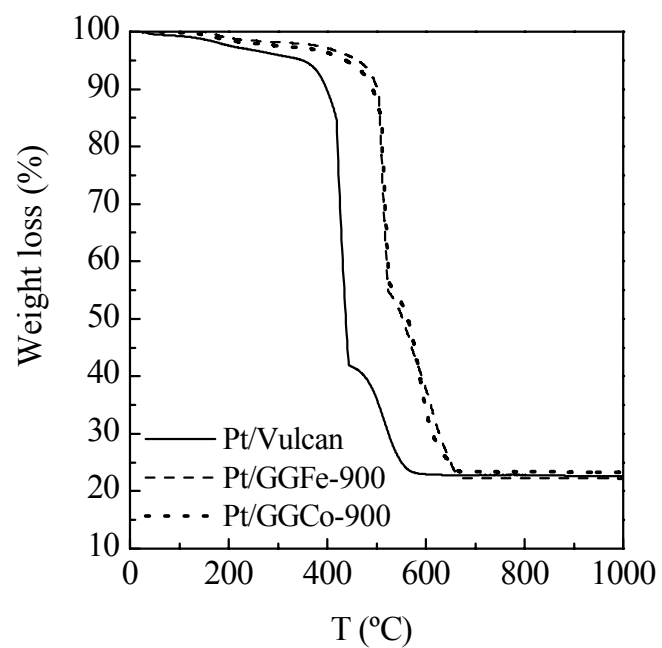


Figure S5. TGA curves of the Pt/GCNs and Pt/Vulcan.