

Bimetallic AgPt Nanoalloys as an Electrocatalyst for Ethanol Oxidation Reaction: Synthesis, Structural Analysis, and Electro-Catalytic Activity

According to Sigma-Aldrich provender information, the technical specifications of the Pt/C commercial electrocatalyst (PRD.0.ZQ5.10000029756) are 20% wt. of Pt loading and crystallite size ≤ 5 nm confirmed by TGA and XRD techniques, respectively. On the other hand, the particle distribution was determined by the SEM-SE technique (Figure S1). The micrograph shows particles well dispersed and particles agglomeration on different zones of the carbon support.

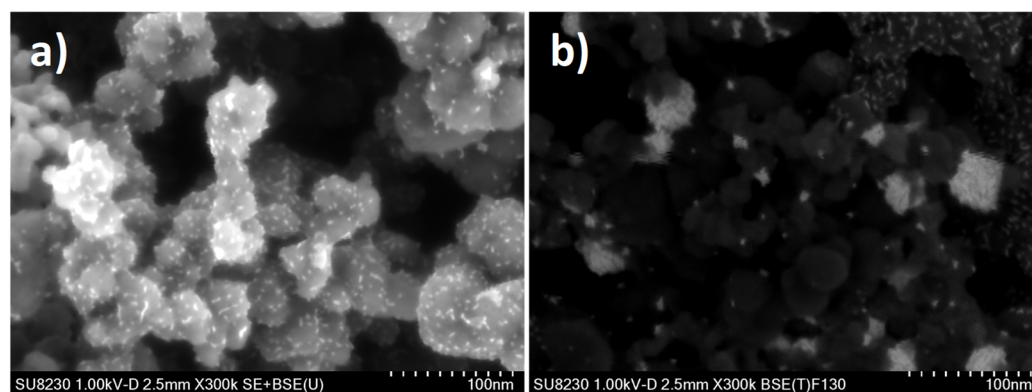


Figure S1. Low-magnification SEM micrographs of Pt/C commercial electrocatalyst purchased from Sigma-Aldrich; a) Secondary electrons image and b) Backscattered electron image.

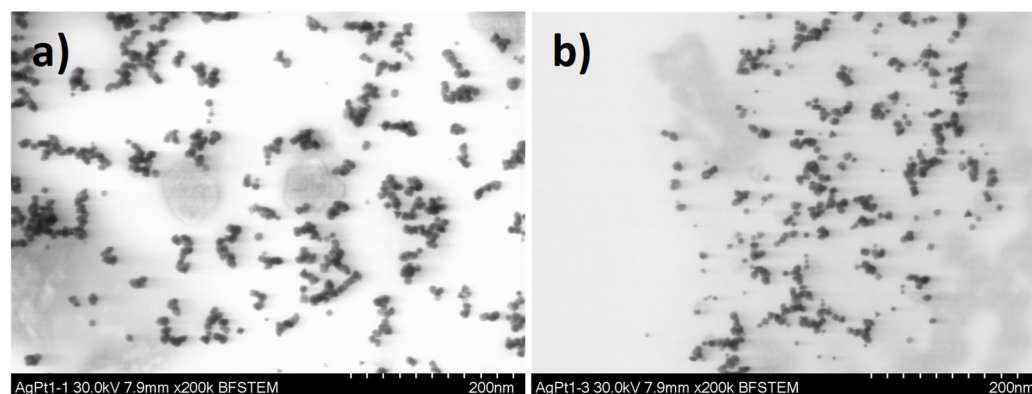


Figure S2. Low-magnification BF-STEM micrographs of a) AgPt (1:1) and b) AgPt (1:3) BNPs.

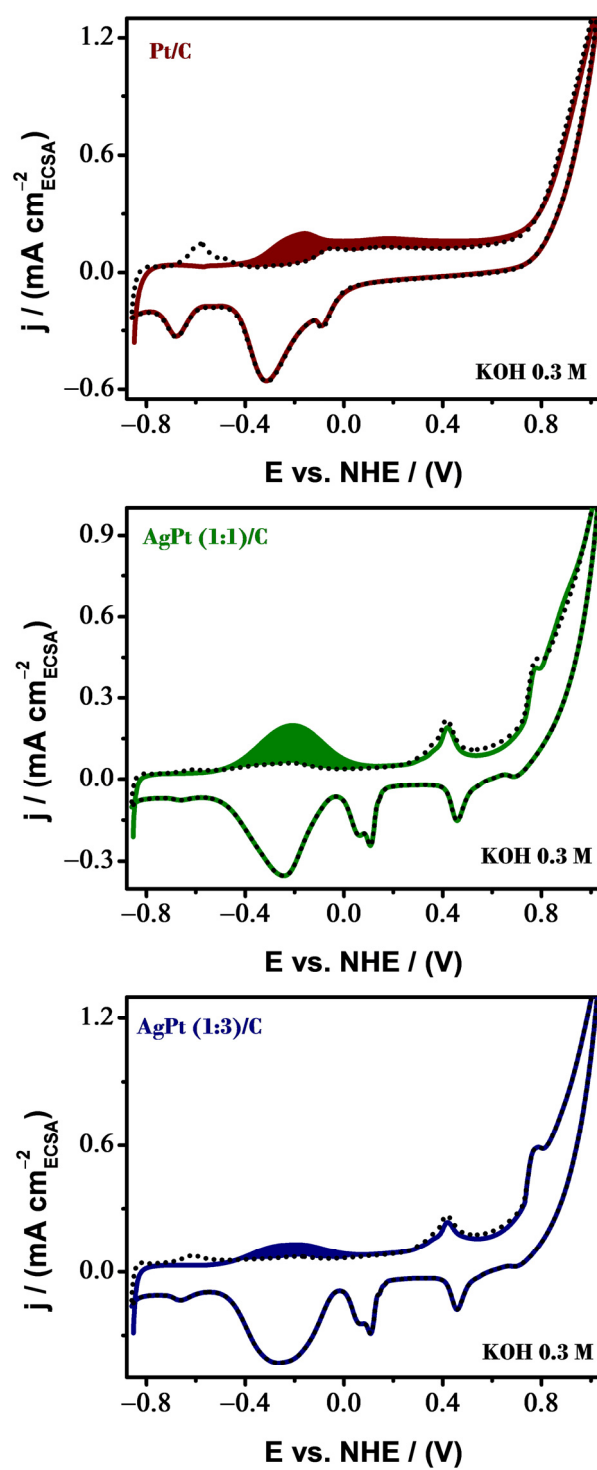


Figure S3. Cyclic voltammograms in alkaline media recorded consecutively after chronoamperometry (CA) measurements for Pt/C, AgPt (1:1)/C, and AgPt (1:3)/C electrocatalysts.

Table S1. Comparison of the catalytic activity of ethanol oxidation using Pt-based materials.

Material	Morphology/size	Test conditions	Catalytic activity	Reference
AgPt (1:3)/C	Spherical nanoparticles/10 nm	0.3 M KOH + 1.0 M Ethanol	3.17 mA cm ⁻²	This work
PtAg	Nanotubes/80 nm	1.0 NaOH + 1.0 M Ethanol	1.97 mA cm ⁻²	[1]
PtRu NWs/C	Nanowires/	0.1 M KOH + 0.5 M Ethanol	3.78 mA cm ⁻²	[2]
PdPt/C	Nanoparticles/17 nm	0.3 M KOH + 1.0 M Ethanol	3.27 mA cm ⁻²	[3]
PtCu NCs/CB	Nanocubes/14 nm	1.0 M KOH + 1.0 M Ethanol	6.75 mA cm ⁻²	[4]
Pt ₃ Pd ₂ /C	Nanoparticles/3.4 nm	0.1 M NaOH + 0.1 M Ethanol	4.7 mA cm ⁻²	[5]
Pt ₄ Pd/C	Nanoparticles/3.5 nm	0.1 M NaOH + 0.1 M Ethanol	3.4 mA cm ⁻²	[5]
PtPbPd/C	Nanowires	0.5 M KOH + 0.5 M Ethanol	2.78 mA cm ⁻²	[6]
PtPd/C	Nanowires	0.5 M KOH + 0.5 M Ethanol	2.66 mA cm ⁻²	[6]
PtPb/C	Nanowires	0.5 M KOH + 0.5 M Ethanol	1.68 mA cm ⁻²	[6]

References

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