

Supplementary material

Influence of Support Material of PtSnNiGa/C Electrocatalysts for Ethanol Oxidation

Deise M. Santos^{a,b}, Giordano T. Paganoto^a, Maria A. R. Queiroz^a, Marco C. C. Guimarães^c, Josimar Ribeiro^{a,*}

Table S1: Main conditions of ICP OES analysis.

Parameter	Condition			
Coolant gas / L min ⁻¹	15			
Auxiliary gas / L min ⁻¹	0.2			
Nebulizer gas/ L min ⁻¹	0.80			
Sample uptake / mL min ⁻¹	1.5			
RF power / W	1300			
Viewing	Axial			
	Pt	Sn	Ni	Ga
LOD / µg L ⁻¹	18.1	39.0	5.0	10.5
LOQ / µg L ⁻¹	59.9	128.6	16.5	37.8
Metal concentration / mg L ⁻¹	8.02	10.91	8.49	3.70

Table S2: Metal concentration in the SE solution after 1000 cycles.

Electrocatalyst	Metal / µg L ⁻¹			
	Pt	Sn	Ni	Ga
Pt ₄₅ Sn ₂₂ Ni ₂₁ Ga ₁₂ /C _{XC72}	71.93	818.3	682.2	173.9
Pt ₄₃ Sn ₂₄ Ni ₂₂ Ga ₁₁ /C _{L6}	<LOQ*	256.8	303.4	201.1
Pt ₄₁ Sn ₂₄ Ni ₂₃ Ga ₁₂ /C _{Plasma}	371.1	191.9	936.6	50.27

*LOQ (Pt) = 59.86 µg L⁻¹ **LOQ (Ga) = 34.78 µg L⁻¹ ***LOQ (Sn) = 128.64 µg L⁻¹ ****LOQ (Ni) = 16.52 µg L⁻¹

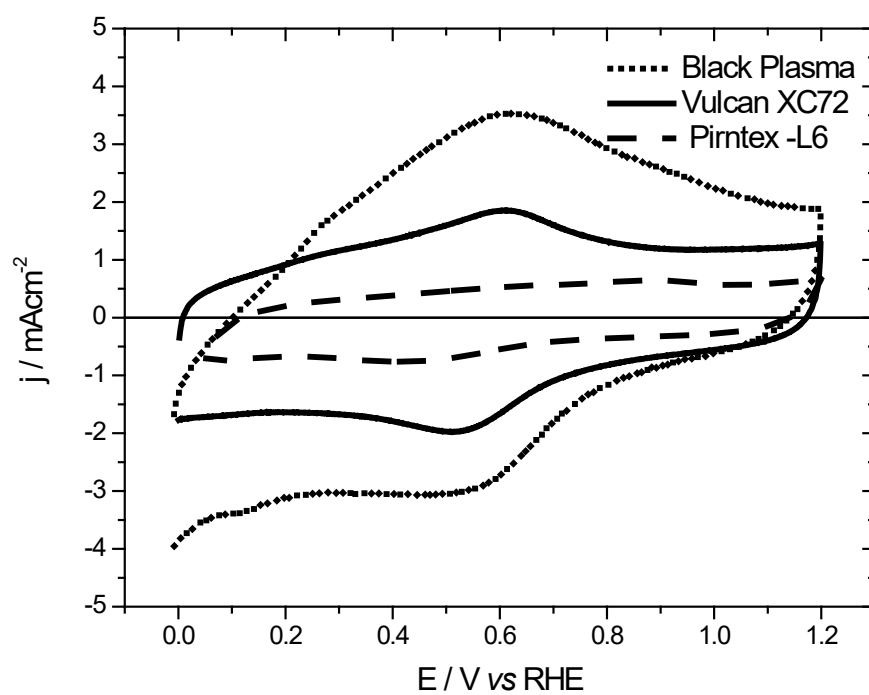


Figure S1. Cyclic voltammetry of Black Plasma, Vulcan XC72 and Pirntex-L6 carbons in SE at scan rate of 20 mVs^{-1} .

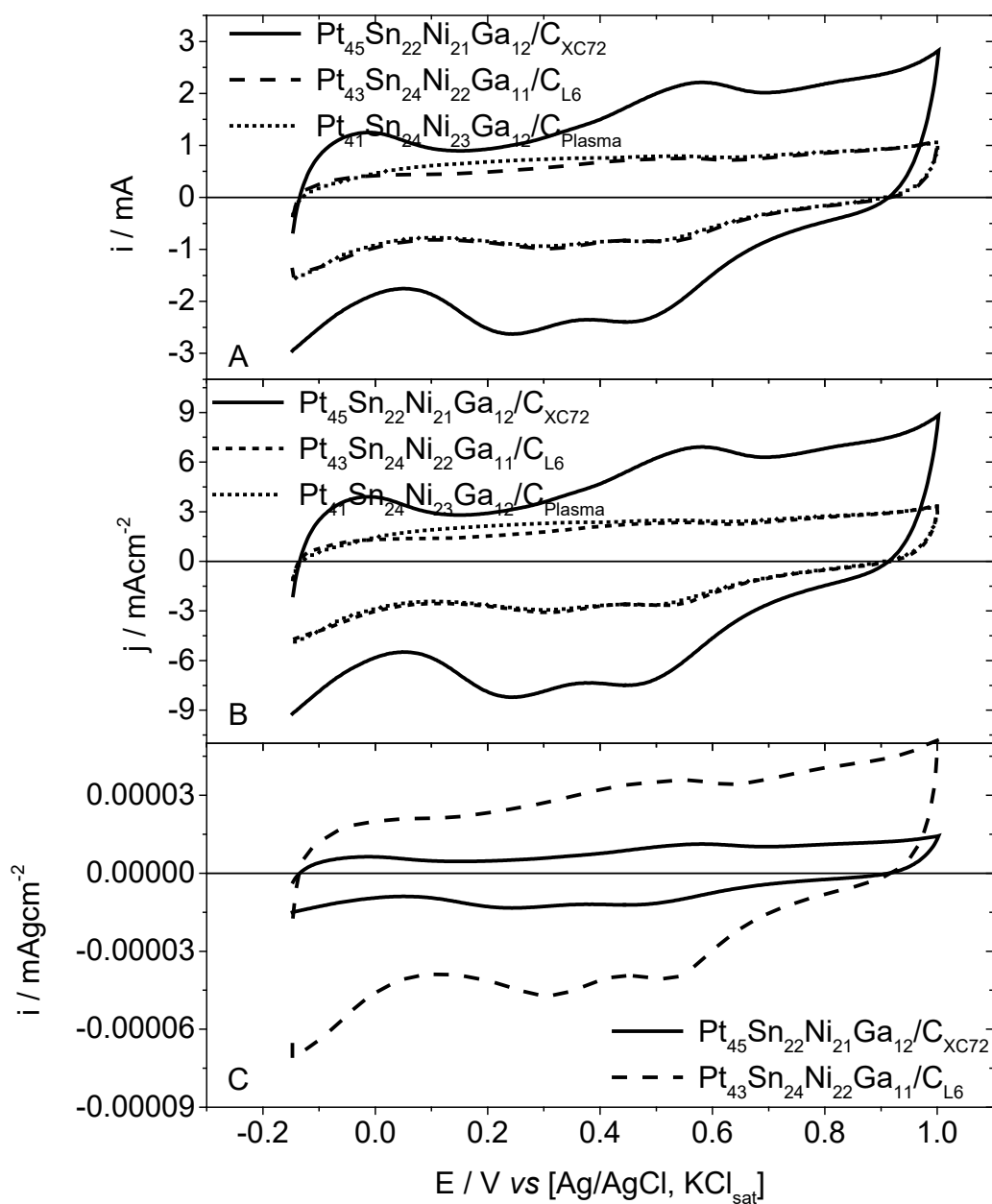


Figure S2. (A) Cyclic voltammetry of the PtSnNiGa/C electrocatalysts in SE at 20 mVs⁻¹ none normalized, (B) normalized by electrode geometric area (0.16 cm²) and (C) normalized by EASA.

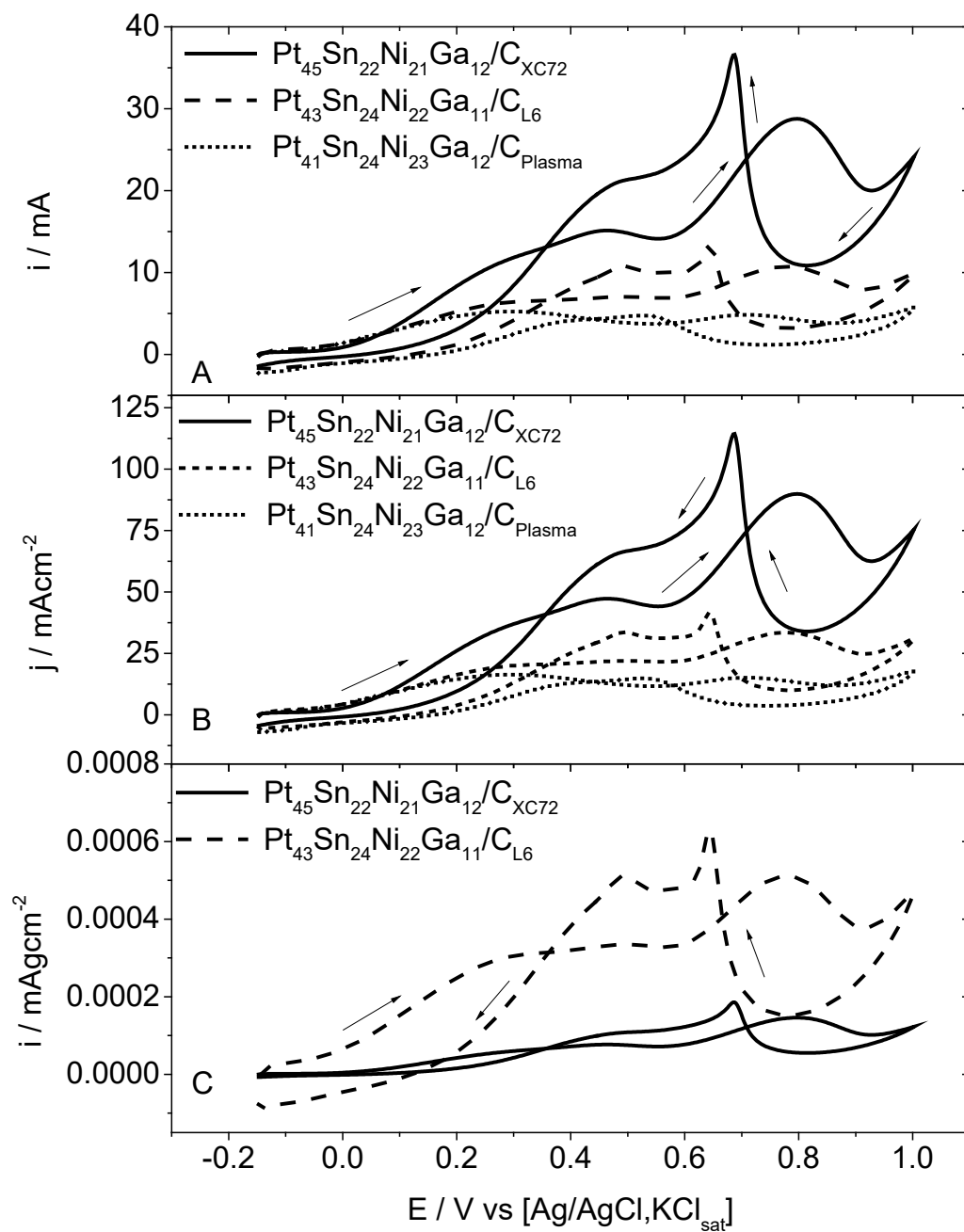


Figure S3. (A) Cyclic voltammetry of the PtSnNiGa/C electrocatalysts in 1.0 mol L⁻¹ ethanol + SE at 20 mVs⁻¹ none normalized, (B) normalized by electrode geometric area (0.16 cm²) and (C) normalized by EASA.

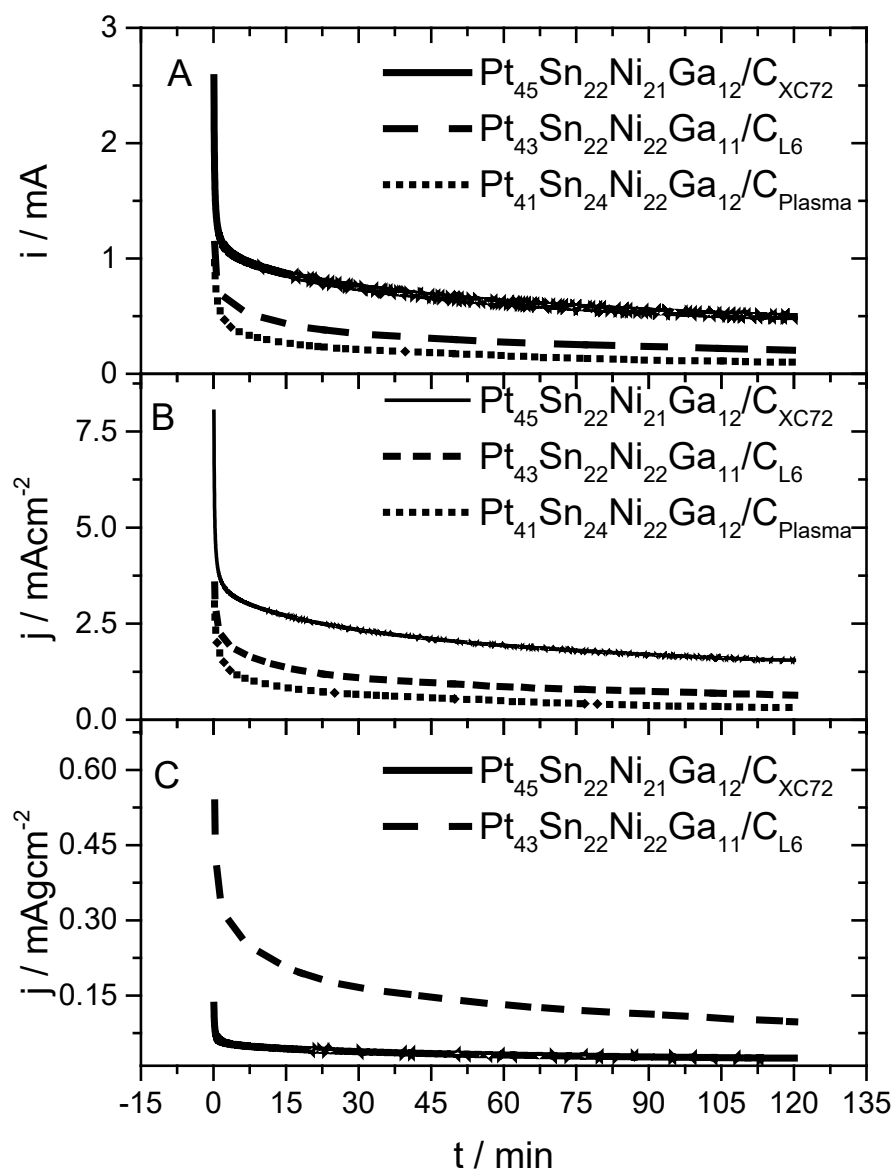


Figure S4. (A) i vs. t at 0.2 V vs. $[\text{Ag}/\text{AgCl}, \text{KCl}_{\text{sat}}]$ curves of the PtSnNiGa/C electrocatalysts in ethanol 1.0 mol L⁻¹ + SE none normalized, (B) normalized by electrode geometric area (0.16 cm²) and (C) normalized by EASA.