

# **Grafting poly(acrylic acid) from PEDOT to control the deposition and growth of platinum nanoparticles for enhanced electrocatalytic hydrogen evolution: Supporting information**

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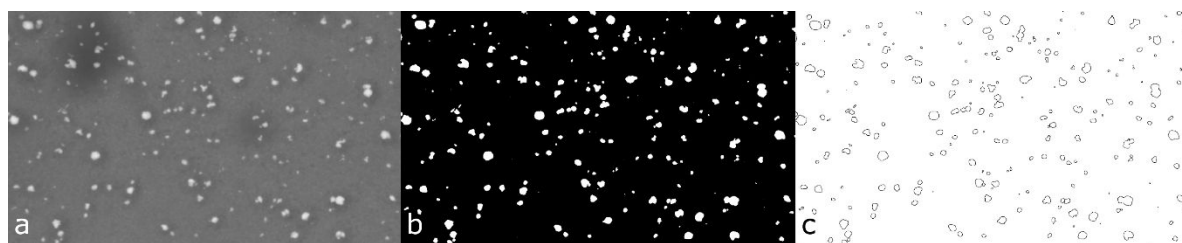
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## *SEM particle analysis using ImageJ software*

SEM images recorded with backscattered electrons were loaded into ImageJ software for particle analysis. Image scaling was set using the SEM scale bar and the 'Set Scale' option, before the scale bar was cropped out for particle analysis. A threshold was applied such that the lightest 5% of all pixels were considered to be PtNPs (i.e. a threshold value of 125), producing a good approximation of the original image (Figure S1). After inverting the image colours, the 'Analyse Particles' macro was run without excluding any particle sizes. The smallest particles (4 x 4 pixels, corresponding to 6.5 x 6.5 nm) were then manually removed from the results as noise. Three images per sample were used to calculate means and standard deviations for nanoparticle

diameters and density per  $\mu\text{m}^2$ . Additionally, the median and quartile values were also calculated for the diameters datasets, to investigate potential skew caused by the minimum pixel size limit.



*Figure S1. Image processing steps for particle analysis: a) backscattered electron image recorded by SEM; b) thresholding applied in ImageJ software; c) particles detected by ImageJ 'Analyse Particles' macro.*

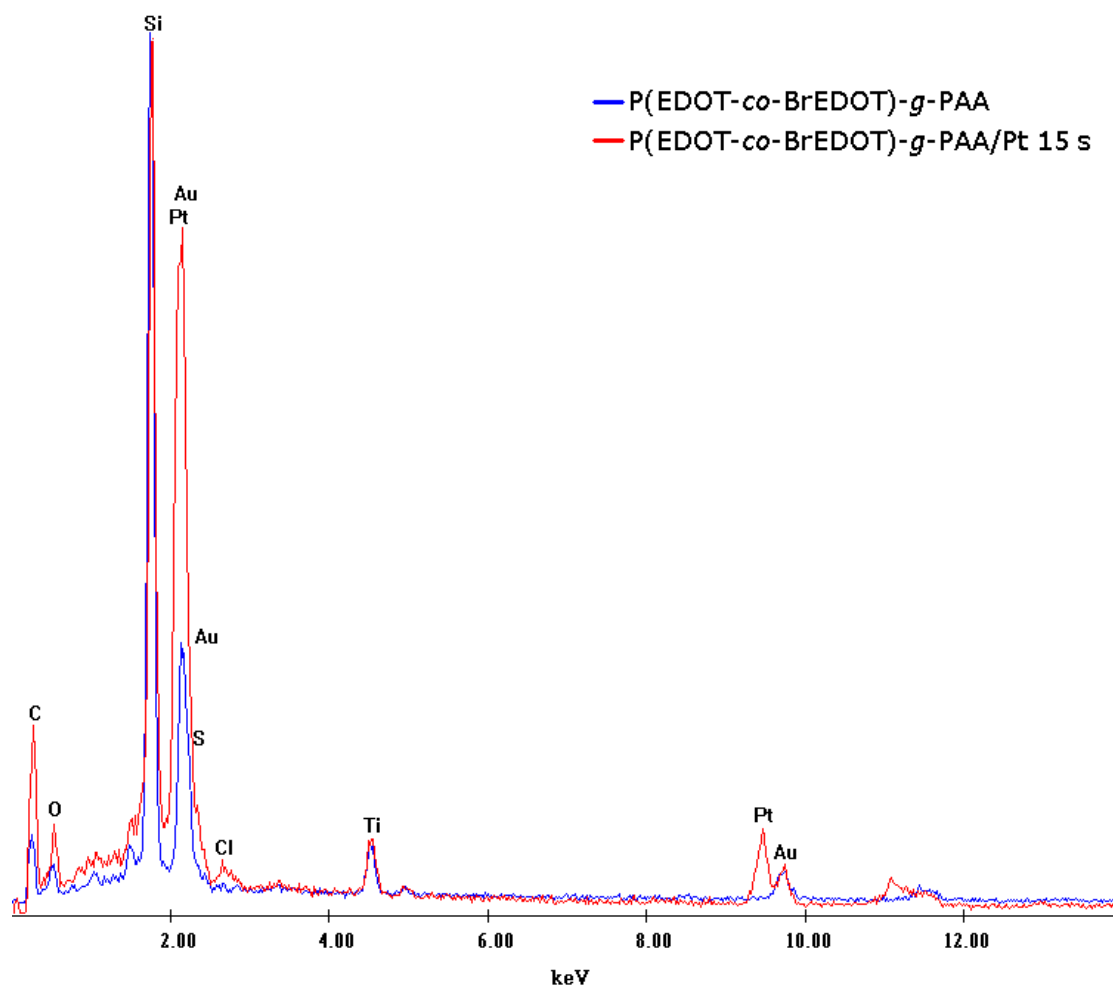


Figure S2. EDS spectra of P(EDOT-co-BrEDOT)-g-PAA without PtNPs (blue, 0 wt% Pt) and after 15 s of PtNP deposition time (red, 4.9 atomic% Pt).

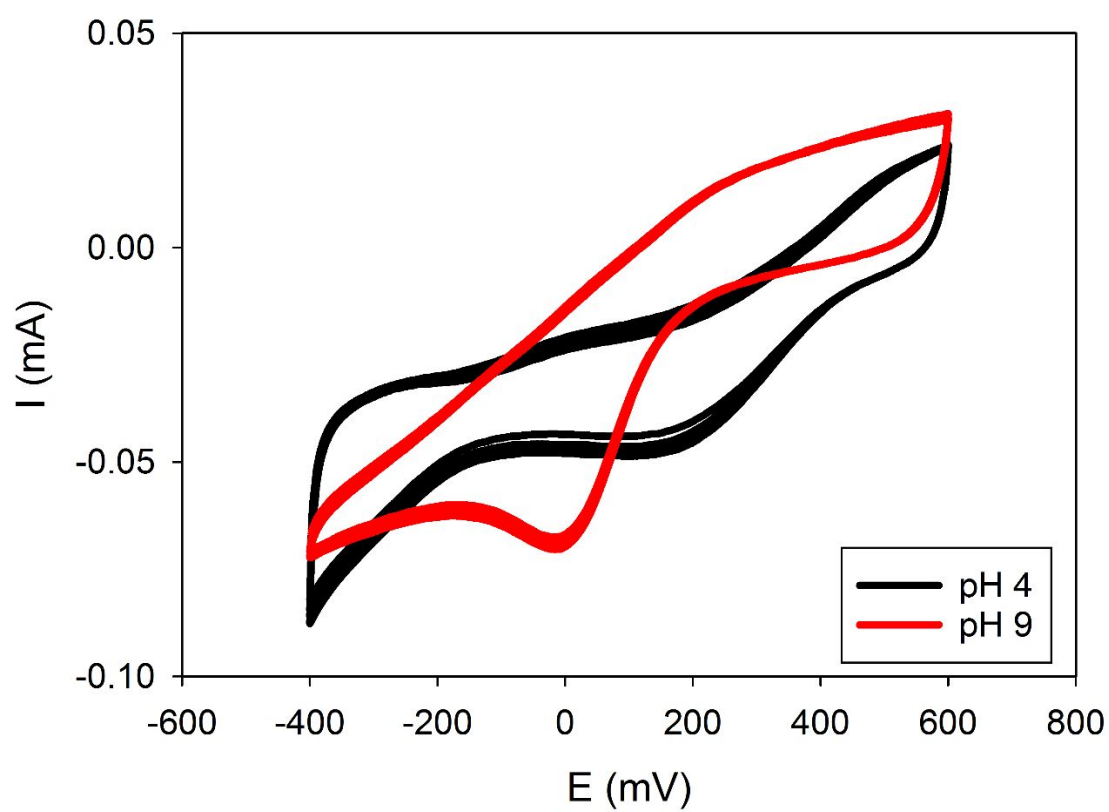


Figure S3. Cyclic voltammograms of Pt wire in 0.1 M  $\text{NaClO}_4$  buffered at pH 4 (citrate buffer, black) and pH 9 (AMPSO buffer, red).