

*2D hexagonal mesoporous platinum films exhibiting biaxial, in-plane, pore alignment, Elliott et al.*  
(supporting information).

SI1 - SEM images of the large area electrode.

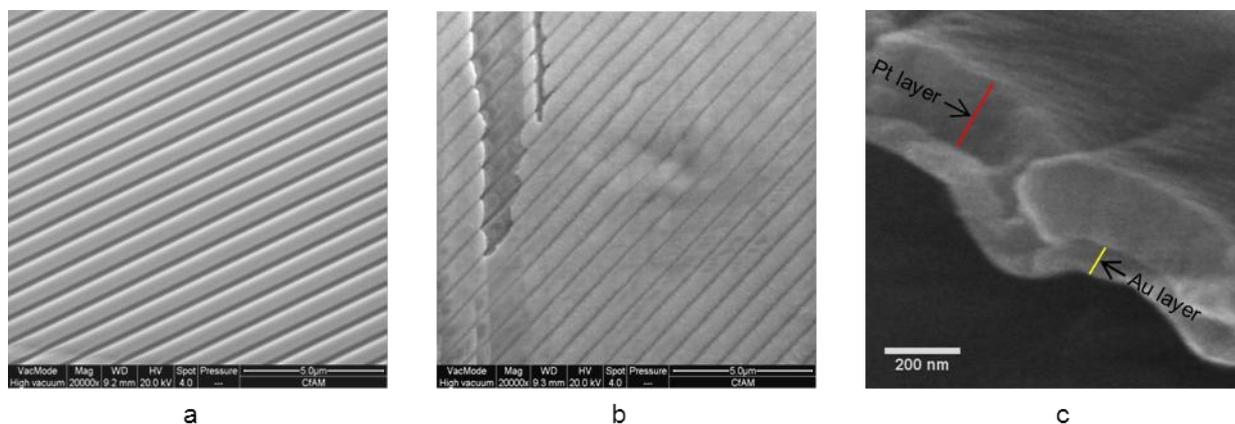


Figure SI1. SEM micrograph of the underlying support electrodes, **a)** prior to electrodeposition, **b)** after electrodeposition with a H<sub>1</sub>-ePt film ( $Q = 0.53 \text{ C cm}^{-2}$ ) and **c)** cross sectional SEM of a H<sub>1</sub>-ePt film ( $Q = 0.61 \text{ C cm}^{-2}$ ) with an estimated thickness of  $180 \pm 10 \text{ nm}$ .

SI2 - Transmission SAXS data for the phase.

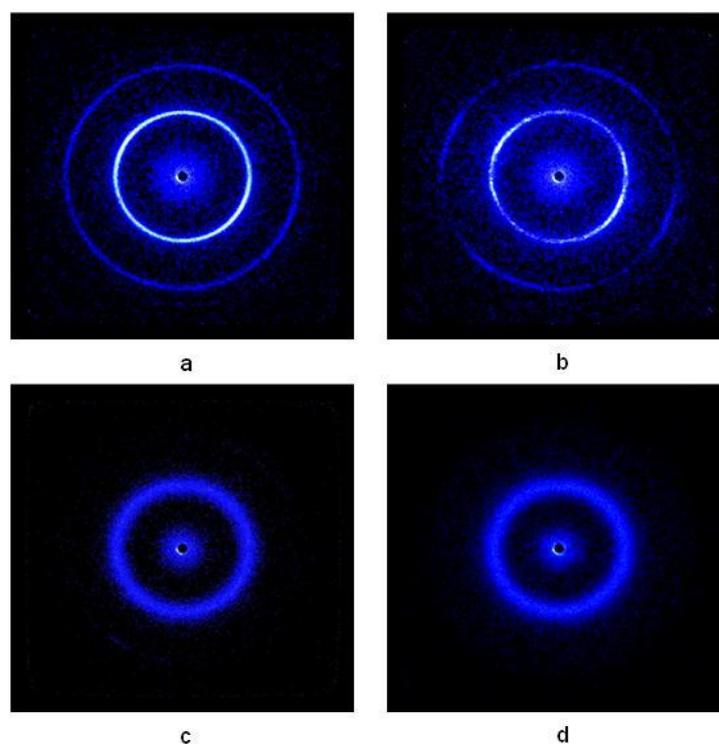


Figure SI2. 2D SAXS for the templating phase at a) 50, b) 70, c) 75 and d) 80 °C over 300s.

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SI3 - Schematic diagram showing sample loading for transmission SAXS analysis

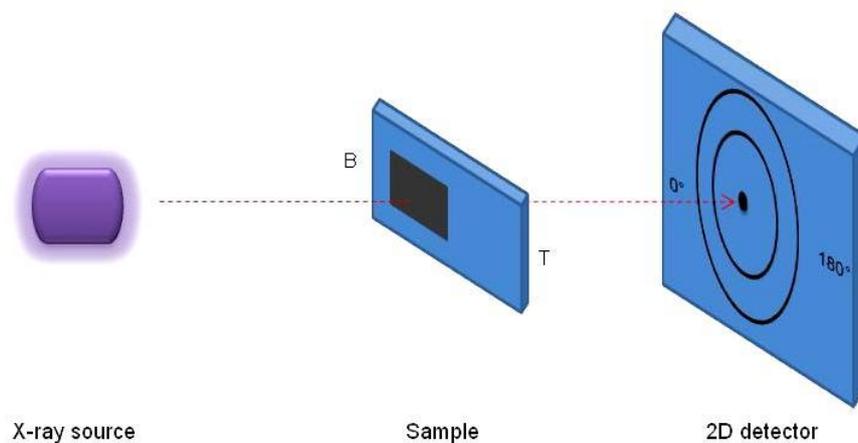


Figure SI3. A Schematic diagram to show loading of a  $H_1-ePt$  film for SAXS analysis. The symbols 'T' and 'B' refer to the top and the bottom of the electrode respectively.

SI4 - Transmission SAXS data for a  $H_1-ePt$  film.

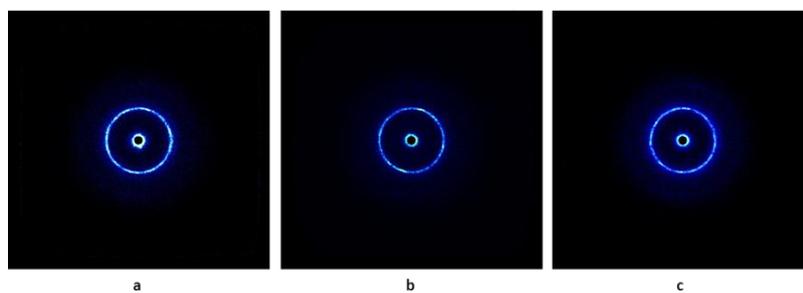


Figure SI4. 2D SAXS patterns taken at various x and y positions for an un-oriented  $H_1-ePt$  film collected over 1800s.

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SI5 and SI6 - Data to show the effect of orientation of the ridges of the support electrode upon the sheared phase and the resulting electrodeposited film.

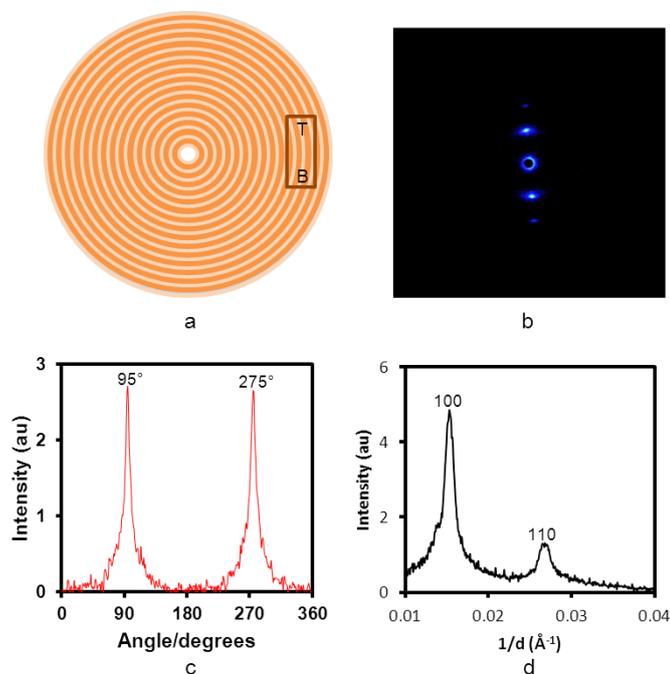


Figure SI5. a) Cartoon to show the orientation of the ridges on the DVD, and the segment taken as a support electrode (ridges parallel to the direction of shear), b) 2D SAXS patterns obtained for the resulting electrodeposited H<sub>1</sub>-ePt film ( $Q = 0.54 \text{ C cm}^{-2}$ ) collected over 1800s, c) corresponding azimuthally integrated 1D SAXS pattern (inner ring, HWHM values are 10 and 11 °) and (d) corresponding radially integrated 1D SAXS pattern.

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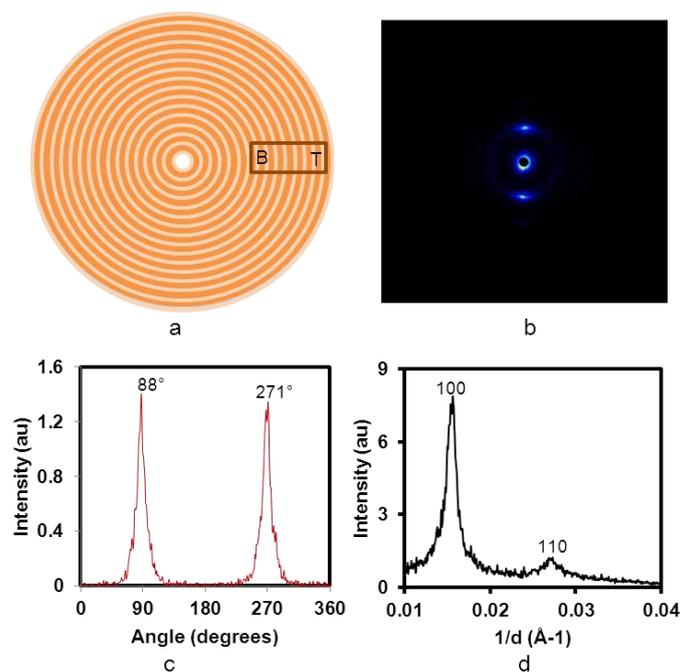


Figure SI6. a) Cartoon to show the orientation of the ridges on the DVD, and the segment taken as a support electrode (ridges perpendicular to the direction of shear), b) 2D SAXS patterns obtained for the resulting electrodeposited  $H_1-ePt$  film ( $Q = 0.57 \text{ C cm}^{-2}$ ) collected over 1800s, c) corresponding azimuthally integrated 1D SAXS pattern (inner ring, HWHM values are 12 and 13 °) and (d) corresponding radially integrated 1D SAXS pattern.

SI7 - Schematic diagram showing sample loading for GI-SAXS analysis, where the X-ray beam and the plane of the electrode are parallel to each other..

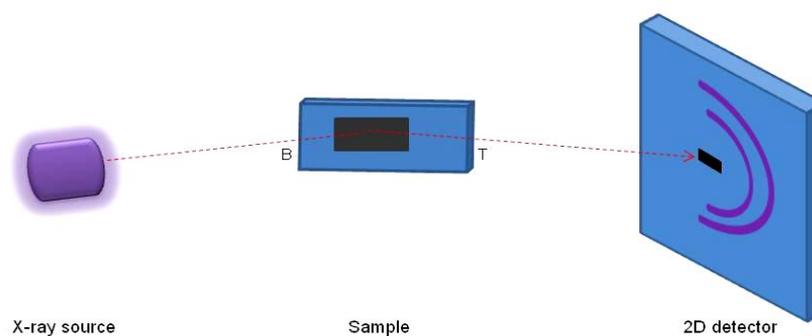


Figure SI7. Schematic diagram to show the loading of a  $H_1-ePt$  film for GI-SAXS analysis. The symbols 'T' and 'B' refer to the top and the bottom of the electrode respectively. The X-ray beam and the plane of the electrode were parallel to each other.

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SI8 - Transmission SAXS data for a  $H_1$ -ePt film deposited from a shear aligned, heat treated, phase.

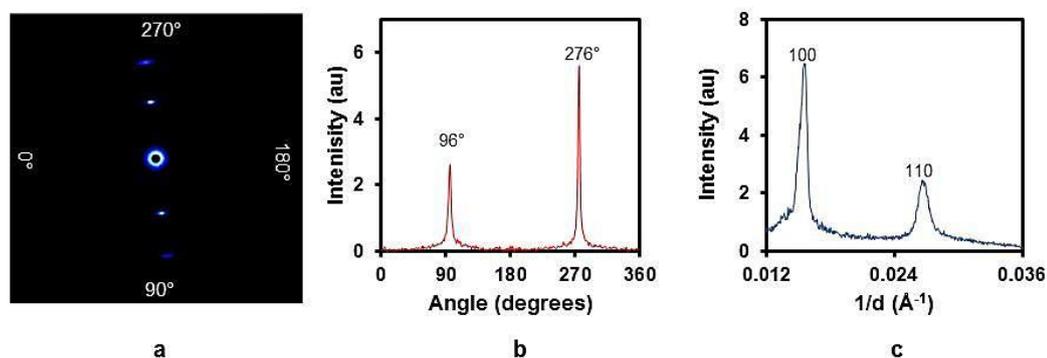


Figure SI8. SAXS analysis of a  $H_1$ -ePt film electrodeposited from a, shear aligned, heat treated, phase ( $Q = 0.54 \text{ C cm}^{-2}$ ). (a) 2D-SAXS pattern collected over 1800s, (b) azimuthally integrated ID SAXS pattern (inner ring) and (c) radially integrated 1D SAXS pattern.

SI9- TEM images for a  $H_1$ -ePt film.

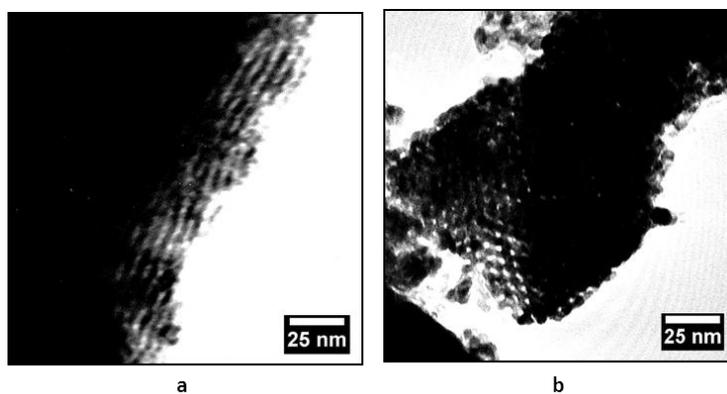


Figure SI9. TEM images of a  $H_1$ -ePt film (a) pores viewed from the side and (e) pores view end on.

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SI10 - Schematic diagram showing sample loading for GI-SAXS analysis, where the X-ray beam and the plane of the electrode are at 90° to each other.

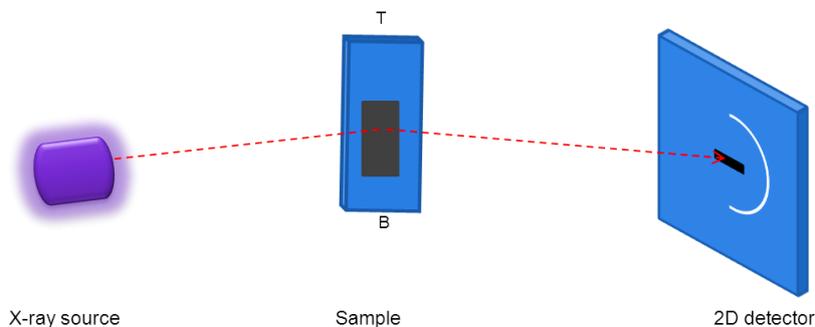


Figure SI0. Schematic diagram to show the loading of a H<sub>1</sub>-ePt film for GI-SAXS analysis. The symbols 'T' and 'B' refer to the top and the bottom of the electrode respectively. The X-ray beam and the plane of the electrode were at right angle to each other.

SI11 - GI-SAXS patterns of an oriented mesoporous (H<sub>1</sub>-ePt) films.

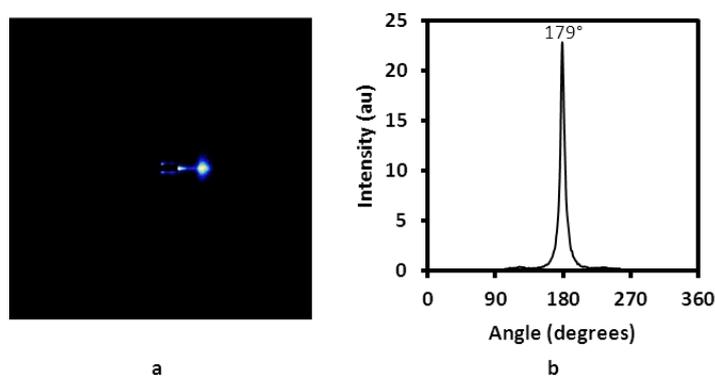


Figure SI11. GI-SAXS data of a H<sub>1</sub>-ePt film electrodeposited from a shear aligned phase. a) 2D GI-SAXS pattern collected over 900s and b) azimuthally integrated 1D SAXS pattern. The direction of the x-rays beam was at right angle to the plane of the electrode.