Electronic supplementary information

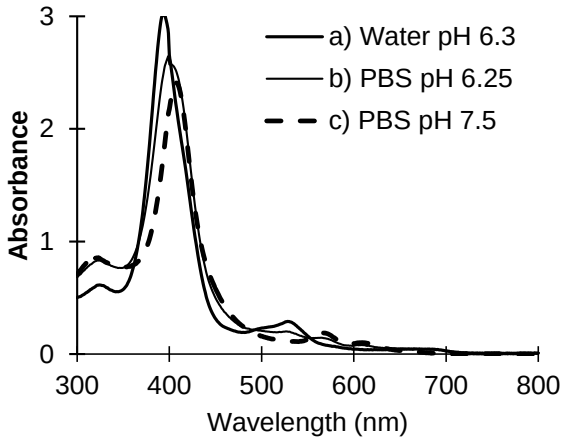

Fig.ESI1: UV-Vis spectra of 60 µM FeTSPP in water pH 6.3 (a), in PBS pH 6.25 (b), pH 7.5 (c).

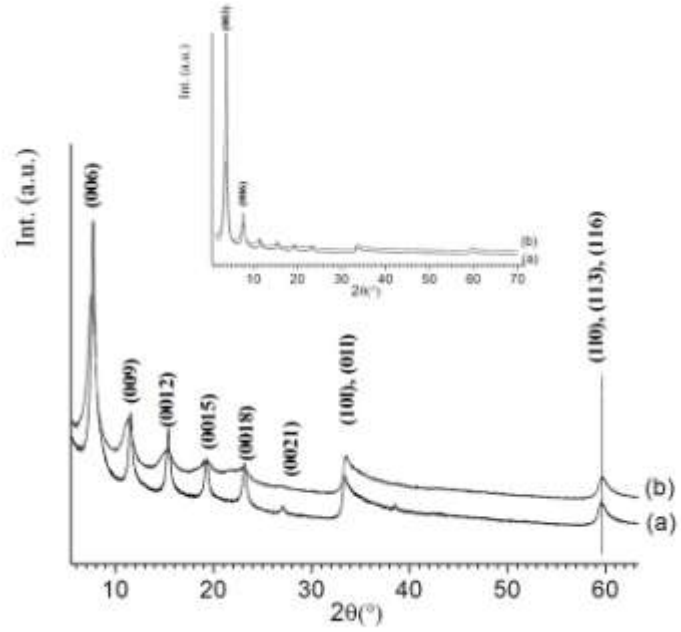

Fig.ESI2: X-ray powder diffraction patterns in the 2θ range 5-65° (inset 1-30°) of (a) Zn_2Cr-ZnTSPP and (b) Zn_2Cr-FeTSPP. Labels give the Bragg reflections in the space group $R\bar{3}m$.

FTIR spectra (Fig.ESI3) show besides the vibration bands of the ZnCr LDH framework at 3500-3400 cm^{-1} (ν_{OH}) and at 576 and 507 cm^{-1} corresponding to the ν_{MO} lattice vibrations, the characteristic bands due to the TSPP porphyrins. IR spectra of TSPP porphyrins are characterized

by four main regions recorded between 2000 and 400 cm^{-1}. Vibration bands in the region 1600-1350 cm^{-1} are due to stretching vibrations of C=C and C=N in phenyl and pyridyl aromatic ring. Bands situated between 1200 and 1010 cm^{-1} are typical of phenyl-sulfonate groups and those between 1000 and 900 cm^{-1} of νC-H rock and δN-H pyrrole groups. Finally, the 700-800 cm^{-1} region is attributed to out of plane C-H vibrations[1]. The fundamental stretching vibrations $\nu_{as}(SO_3)$ and $\nu_s(SO_3)$ are observed at 1176 and 1037 cm^{-1} for Zn_2Cr-ZnTSPP and at 1180 and 1038 cm^{-1} for Zn_2Cr-FeTSPP. The position of these two bands are practically the same than that observed reported for the corresponding ZnAl-porphyrin hybrids, with bands at 1171 and 1036 cm^{-1} for ZnAl-ZnTSPP[2] and 1184 and 1039 cm^{-1} for ZnAl-FeTSPP[3]. These peak positions are similar to the free porphyrins, suggesting that SO_3^- groups of intercalated porphyrins interact with the LDH layers via weak noncovalent interactions.

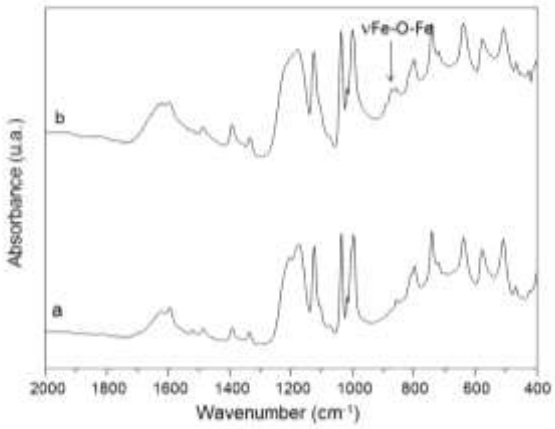

Fig.ESI3: FTIR spectra of Zn_2Cr-ZnTSPP (a) and Zn_2Cr-FeTSPP (b).

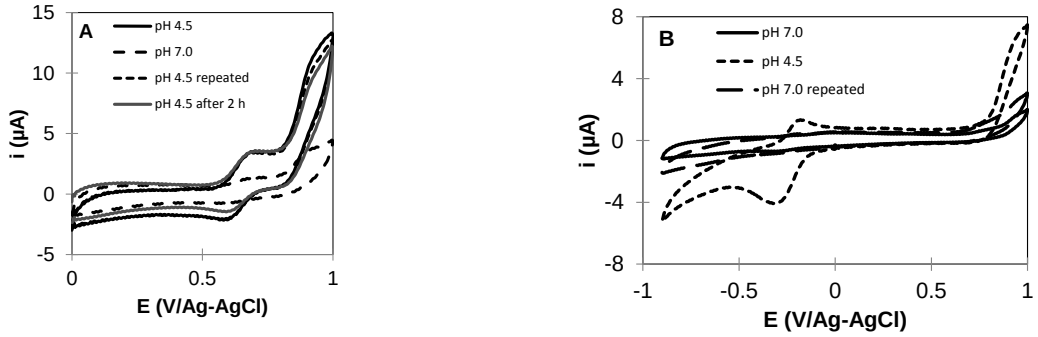

Fig.ESI4: Cyclic voltammograms recorded in different PBS using the same Zn_2Cr-ZnTSPP/GCE (20^{th} cycles) (A) and Zn_2Cr-FeTSPP/GCE (10^{th} cycles) (B) (0.1 M PBS under argon, v = 50 mV s^{-1}).

References

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3. M. Halma, A. K. Dias de Freitas Castro, C. Taviot-Gueho, V. Prevot, C. Forano, F. Wypych and S. Nakagaki, *J. Catal.*, 2008, **257**, 233-243.