



Supporting Information

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Photochemical and Electrochemical Encoding of Erasable Magnetic Patterns

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Supporting Information

The cyclic and linear sweep voltammetry as well as *in-situ* measurements under constant potential applied on the modified electrode were performed using an electrochemical PC-controlled analyzer-potentiostat IVIUM (PalmSensPC software). The chronoamperometric measurements were performed using an electrochemical analyzer Potentiostat/Galvanostat (EG&G Model 283) connected to a computer (EG&G Software No 270/250). All electrochemical experiments were performed using Ag/AgCl as reference electrode.

The SEM measurements were performed on the respective modified Au-coated glass plates using a UHR FEG SEM, model SIRION (FEI, USA), resolution 1.5nm. The EDS analysis was performed on Phoenix spectrometer (EDAX, USA), resolution 128 eV. Quantification of the atomic percentages in the EDS was done by the ZAF matrix correction system.

The surface plasmon resonance (SPR) Kretschmann type spectrometer "BIOSUPLAR-2" (light-emitting diode light source, $\lambda = 670$ nm) and the Au-coated glass slides from "Analytical μ -Systems" (Germany) were used in this work. An auxiliary Pt and a quasi reversible Ag reference electrodes made from wires of 0.5-mm diameter were parts of the cell, thus allowing *in situ* electrochemical SPR measurements upon the electrochemical processes on the modified surface. All measurements were performed at a temperature of $25 \pm 2^\circ\text{C}$.

The XPS measurements were performed on a Kratos Axis Ultra X-ray photoelectron spectrometer. Spectra were acquired with monochromated Al K α (1486.7 eV) X-ray source with three take-off angles: 0° , 35° and 75° (the grazing angle). The pressure in the test chamber was maintained at 1.5×10^{-9} Torr during the acquisition process. High resolution XPS scans were collected for Co 2p, O 1s, C 1s, N 1s and Au 4f peaks with pass energy of 20 eV and the step value of 0.1 eV. The XPS binding energy was calibrated with respect to the peak position of Au 4f_{7/2} as 84.0 eV. Data analysis was performed with Vision processing data reduction software (Kratos Analytical Ltd.) and CasaXPS (Casa Software Ltd.).

The zero field cooled dc magnetic moment (M(T)), measured at 1 kOe in the temperature range of 5-200°K were performed using a commercial (Quantum Design) super-conducting quantum interference device (SQUID) magnetometer. Isothermal magnetizations vs. field intensity studies M(H) have been performed at 5° and 100°K .

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