Fountain Pen for Scanning Electrochemical Microscopy

-- Electronic Supporting Information --

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S1: Fountain pen photographs.

Figure S1. Photographs of the fountain pen probe working in a) pointillist and b) scanning mode.
S2: Working distance of the *unbent* and *bent* fountain pen probes.

Figure S2. Schematic representation of the SECM contact mode and the working distance for unbent and bent fountain pen probes.

If the probe is pressed against the substrate, it bends. In this way after contact, $d$ does not vary linearly with the movement of the mechanical positioning system. For this reason, we shall define $h_A$ as the height of the attachment point of the soft stylus probe with respect to the sample surface, which varies linearly with the $z$ position of the positioning system. If $l_T$ is the length of the probe in the unbent state, the substrate-electrode distance $d$ that is always positive differs from the quantity $h_p = h_A - l_T$ that can assume negative values when the probe is pressed against the substrate. The situation is shown in Figure S2. After contact, the polished front end of the probe forms an angle $\alpha$ to the sample surface that increases upon further bending of the probe. Thus $d$ is completely defined by $d = h_p + t_L \sin (\alpha)$, where $t_L$ is the thickness of the polymeric film that is between the sample surface and the carbon electrode.