

13-cis-retinoic acid on coinage metals: Hierarchical self-assembly and spin generation

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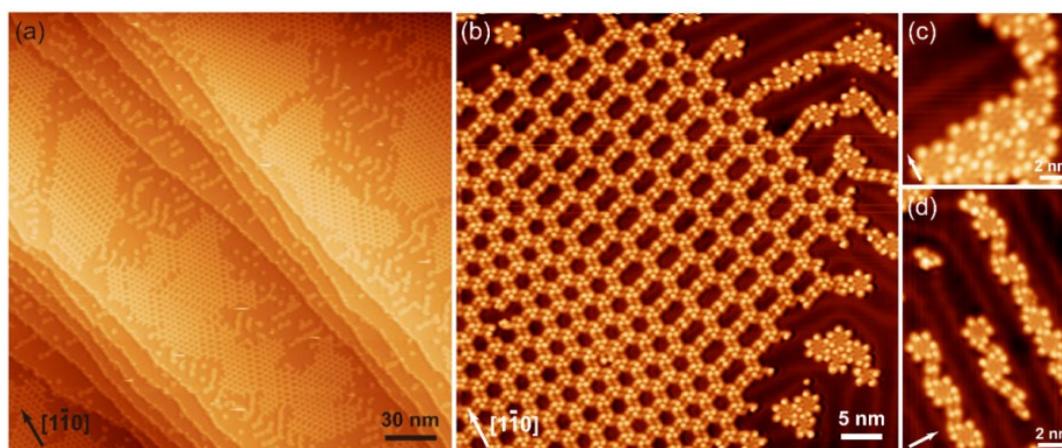


Fig. S1 (a) Large-scale STM image of cis-ReA on Au(111). (b) Coexistence of the elongated and equilateral hexagonal pattern. The isolated hexamers and their clusters are observed around the pattern. (c) A small island made up by cis-ReA hexamers. (d) Chains composed of cis-ReA hexamers and dimers. The formation of hexamers reflects the importance of the molecule-substrate interaction because the hexamer formed by cyclic hydrogen bonds is unstable according to the DFT calculations reported in Ref. 38. In (c) and (d), arrows indicate the $[1\bar{1}0]$ direction. Scanning parameters: (a) $V = 1$ V, $I = 22$ pA; (b) $V = 300$ mV, $I = 22$ pA; (c) $V = 20$ mV, $I = 32$ pA; (d) $V = 20$ mV, $I = 32$ pA.

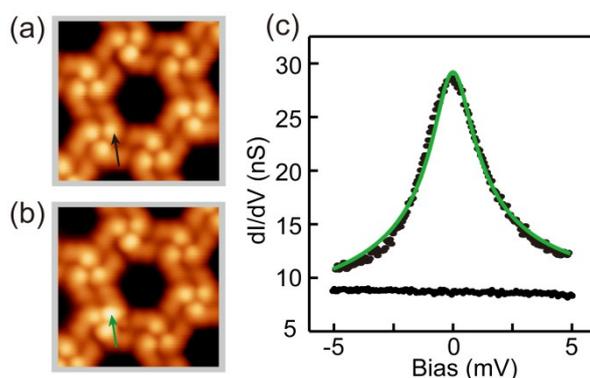


Fig. S2 (a, b) STM images of cis-ReA molecules in the hexagonal network before and after manipulating the marked molecule (arrows) by applying an elevated sample

voltage $V = -2.5$ V. (c) dI/dV spectra of the marked molecule before (lower data points) and after (upper data points) manipulation. The resonance in the spectrum, modelled by a Fano line shape (green line) indicates the generation of a localized spin. Scanning parameters in the images: 6.2×6.2 nm², $V = 30$ mV, $I = 52$ pA.