Supplementary Information

Screening the 4f-electron spin of TbPc$_2$ on metal substrates by ligand channeling

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Figure S1. STM images of YPc$_2$ grown on Au(111). (a) Domain of Phase I ($V_S = -1.0$ V, $I_T = 80$ pA). The molecule orientation makes an angle of 40° with respect to the [110] direction of the Au substrate (inset: 2 nm x 2 nm; $V_S = -0.2$ V, $I_T = 100$ pA); (b) Domain of Phase II ($V_S = -0.7$ V, $I_T = 70$ pA). (c) Topographic line scan across the monolayer island, blue line in (a), its apparent height is 0.35 nm.

Figure S2. Constant height differential conductance maps at an isolated TbPc$_2$ molecule on Ag(111). Eight lobes are clearly visible at negative polarity, whereas a boomerang shape is obtained at positive bias. Set point parameters are: $V_S = 0.40$ V and $I_T = 0.70$ nA.