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Proximity induced Shiba states in an organic radical molecular junction¹ JOSHUA ISLAND, ROCCO GAUDENZI, ENRIQUE BURZURI, HERRE VAN DER ZANT, Delft Univ of Tech — Superconductors containing magnetic impurities lead to interesting phenomena derived from the interaction between Cooper pairing and Kondo screening. Here, we present measurements on proximity induced superconducting break-junctions hosting a magnetic impurity in the form of a neutral and stable, all organic radical molecule. Transport measurements reveal sub-gap excitations which are characteristic of a spin-induced, Yu-Shiba-Rusinov (Shiba) bound state due to the interaction of the radical's unpaired spin with a strongly coupled, proximity-induced superconductor. We show that by applying an external magnetic field to suppress the proximity induced superconductivity, a zero bias peak emerges signaling Kondo screening of the radical's unpaired spin coupled to normal leads. Our results show that Shiba states are a robust feature of the interaction between a magnetic impurity and a proximity induced superconducting junction.

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