Unique direct synthesis of cyanide-bridged Fe_2Cu_2 molecular squares by destruction of sodium nitroprusside.

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The one-pot reaction of copper powder, sodium nitroprusside, ammonium thiocyanate and 2,2′-bipyridine (bpy) in acetonitrile solution at ambient conditions of air and water yields the novel heterometallic $[Fe_2Cu_2(bpy)_6(\mu\text{-}CN)_4(NCS)_2]_2[Fe(CN)_5(NO)](NCS)_2{\cdot}5H_2O$ complex **1**, which has been structurally and magnetically characterized. The most prominent feature of this complex is the unique tetranuclear squares comprised $[Cu(bpy)NCS]^+$ and $[Fe(bpy)_2]^{2+}$ corners with CN edges. The Cu⋯Cu and Fe⋯Fe separations are ~6.72 and ~7.73 Å, respectively. The variable-temperature magnetic susceptibility study revealed that a very weak antiferromagnetic coupling is active between Cu(II) centers (J_{CuCu} = −0.37 cm^{-1}).

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