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Magnetic properties of TCNQF4 reacted with Ni(cod)₂ IAN TERRY, KIMBERLY QUINN, MAREK SZABLEWSKI, Department of Physics, Durham University, Durham, DH1 3LE, UK — Recently it was reported that a room temperature ferromagnetic material ($T_c > 400\text{K}$), Ni_2TCNQ , was synthesized by reacting the organic acceptor tetracyanoquinodimethane (TCNQ) with bis(1,5 cyclooctadiene) nickel ($\text{Ni}(\text{cod})_2$)[1]. In the present work we report the magnetic properties of a material which was synthesized following the same chemical route as that of Ni_2TCNQ , except tetrafluoro-tetracyanoquinodimethane (TCNQF4) was used instead of TCNQ. The new metal-organic compound shows qualitatively similar magnetic properties to Ni_2TCNQ , with ferromagnetic behavior being observed at room temperature. The specific magnetic properties can be described by assuming that there is both a paramagnetic and ferromagnetic phase in the material, with the ferromagnetic phase having a measured Curie temperature of about 620K, close to that of nickel. TEM and XRD data provide evidence for the existence of nickel nanoparticles within the material. We conclude that nickel nanoparticles are produced during the synthesis and are probably responsible for ferromagnetic properties observed at room temperature. I.R. Jain *et al*, Nature **445**, 291, (2007).

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