

## Size and morphology-controlled synthesis of Ni<sub>3</sub>C nanoparticles in a TEG solution and their magnetic properties

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### Supporting information

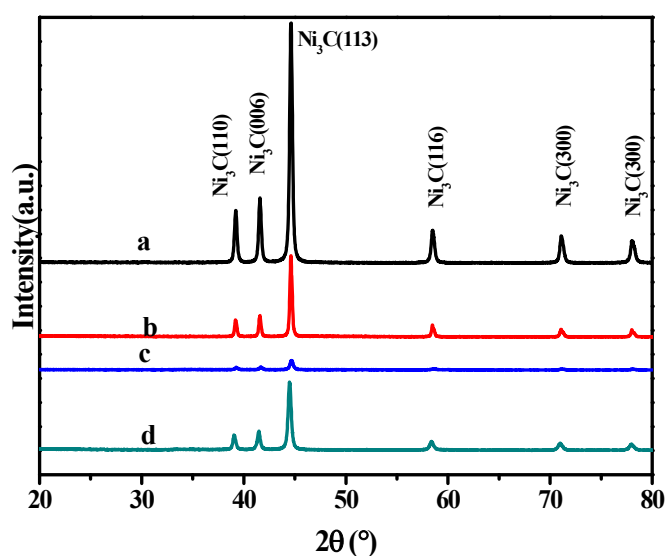


Figure S1 XRD patterns for the products under (a) 0 g; (b) 1 g; (c) 2 g; (d) 4 g TPPO

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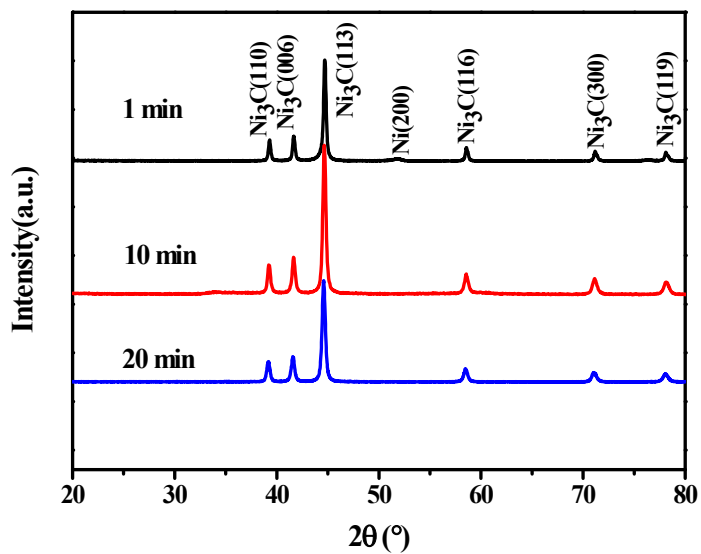


Figure S2 XRD patterns of products obtained under 300°C at different reaction time

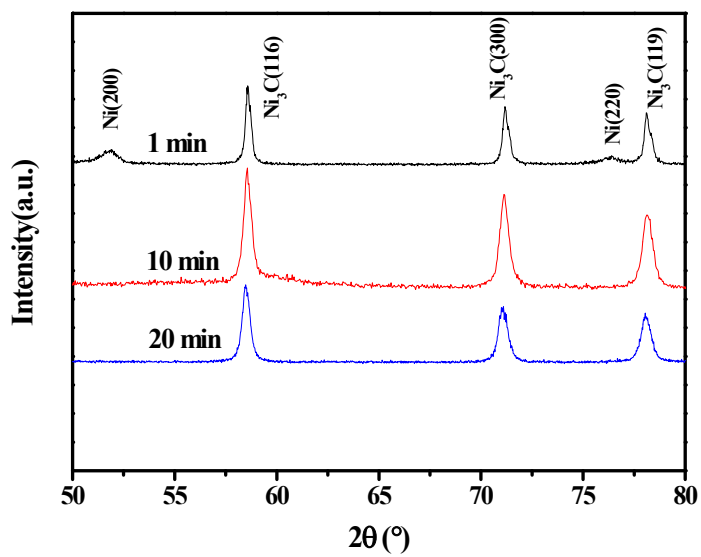


Figure S3 Enlarged XRD patterns of products obtained under 300°C at different reaction time

Ni (NO<sub>3</sub>)<sub>2</sub>•6H<sub>2</sub>O of 0.59 g (Adamas, 99.99%) and triphenylphosphine oxide (TPPO, Acros, 99%) of 1.0 g were dissolved in tetraethylene glycol (TEG, Acros, 99.5% ) of 50 mL. The solution was stirred constantly for 20 min at room temperature and the resulting green solution under argon atmosphere. And the solution was first heated to 110 °C for 20 min to remove a trace of water, then it was heated to 200 °C at heating rate of 6 °C per min, and 3 mL of N<sub>2</sub>H<sub>4</sub>•6H<sub>2</sub>O was dropped into the solution, and then the reaction was performed for 6 hours. At last, the obtained product was centrifuged, washed by ethanol for many times, and then dried in a vacuum oven at 80 °C for 12 h for characterization. There are Ni and Ni<sub>3</sub>C phases in the XRD pattern, and Ni is the main phase.

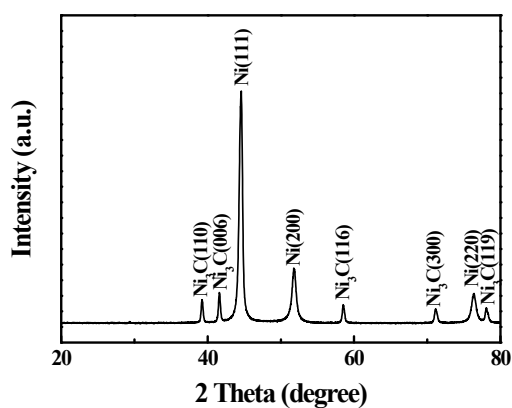


Figure S4 XRD pattern of product obtained under 200°C in TEG solution for 6 hours