

**Supplementary Materials:**

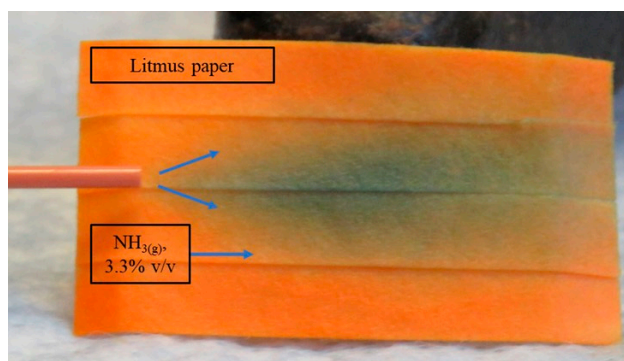


Figure S 1. NH<sub>3(g)</sub> (3.3% v/v, 25 mL/min (NTP) makeup with N<sub>2</sub>) sprayed over wet litmus paper

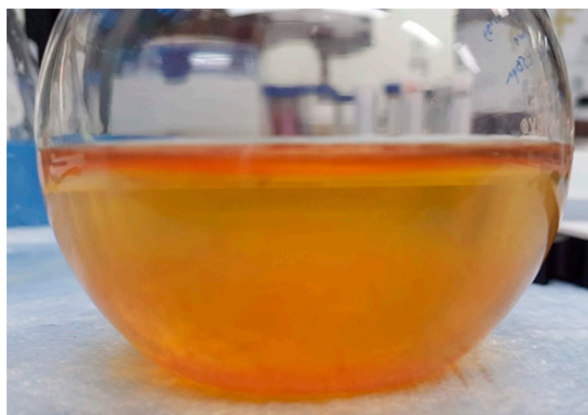


Figure S 2. Synthesis of a nonmagnetic iron oxide from an iron salt solution (1.0 mM  $\Sigma\text{Fe}$  and 2:1 Fe<sup>2+</sup>:Fe<sup>3+</sup>) with 3.3 % (v/v) NH<sub>3(g)</sub>.

Since the intention of this work was the synthesis of phase pure MNPs with high yield, only 1 mM total Fe<sup>2+</sup>, Fe<sup>3+</sup> was studied (Figure S 2). This synthesis did not result in a high MNP yield as evidenced by non-magnetic particles that remained in suspension (Figure 5 and Figure 6).