Abstract Submitted
for the TSF13 Meeting of
The American Physical Society

**Thermogravimetric and magnetic characterization of solution combustion synthesized YFe2O4** SHANGIR SIDDIQUE, MKHITAR HOBOSYAN, CHAMATH DANNANGODA, KAREN MARTIROSYAN, University of Texas at Brownsville — YFe2O4 has interesting magnetic properties which are sensitive to the crystalline size of particles. The rare-earth ferrites similar to YFe2O4 are widely used in fuel cells, catalysts, gas sensors, magnetic materials, and environmental monitoring application. Yttrium ferrite exhibits soft magnetic properties which can be used in devices with high frequency applications. Recent studies also show that it has electrical and magnetic coupling, and shows ferroelectricity near the ferrimagnetic transition temperature around 250 K. It is also a multiferroics, and displays more than one primary ferroic order parameter simultaneously. We prepared YFe2O4 by solution combustion synthesis, using Y(NO3)3 x 6H2O, Fe(NO3)3 x 9H2O and glycine NH2CH2COOH, that were dissolved in distilled water. The mixture was gradually vaporized during heating at 250 °C. The produced soft foam then was ignited and a light brown fluffy product was received. We analyzed the solution combustion of ferrite by thermo-gravimetric analysis to understand the mechanism of interaction, as well as characterized the combustion products by XRD and measured magnetic properties over the temperature range from 1.8K to 300K with PPMS. According to TGA results, the decomposition of the nitrides starts at around 150 °C. The exothermic interaction begins at 200 °C. The product has good magnetic properties. The saturation magnetization began at a magnetic force of 3100 Oe, with magnetic moment of 34 emu/g, and at 1000 Oe the magnetic moment is 24 emu/g.

Shangir Siddique
University of Texas at Brownsville

Date submitted: 13 Sep 2013 Electronic form version 1.4