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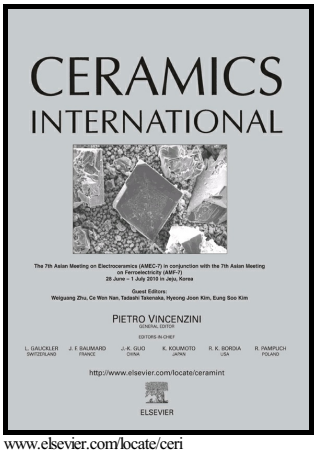


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PII: S0272-8842(17)31474-8
DOI: http://dx.doi.org/10.1016/j.ceramint.2017.07.043
Reference: CERI15763

To appear in: *Ceramics International*

Received date: 28 June 2017
Revised date: 5 July 2017
Accepted date: 6 July 2017

Cite this article as: Suman Sharma, Narayan Dutt Sharma, Nisha Choudhary Mukesh Kumar Verma and Devinder Singh, Chromium incorporated nanocrystalline cobalt ferrite synthesized by combustion method: Effect of fuel and temperature, *Ceramics International* http://dx.doi.org/10.1016/j.ceramint.2017.07.043

# Chromium incorporated nanocrystalline cobalt ferrite synthesized by combustion method: Effect of fuel and temperature

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**Abstract**

Nanocrystalline $CoCrFeO_4$ samples were prepared by Cost effective and low temperature combustion method using different fuels as glycine, urea and polyvinyl alcohol and the effect of temperature on their physical properties has been studied. The thermal study of the precursor gels was done by using Thermogravimetric and Differential thermal analysis (TG-DTA). Occurrence of the cubic spinel phase for the samples was confirmed by the Rietveld analysis of X-ray diffraction (XRD) data. The refinement results also confirm that the cationic distribution over the tetrahedral and octahedral sites in the spinel lattice of samples is partially inverse. The magnetic studies indicate a superparamagnetic behavior, showing an increase in the blocking temperatures with the particle size in case of all fuels. All the samples showed