

Contribution ID: 2182 Type: Oral (Graduate Student) / Orale (Étudiant(e) du 2e ou 3e cycle)

Reversibility of Magnetic Behavior in High Entropy Oxides (G)

Monday 11 June 2018 17:15 (15 minutes)

High entropy materials are a group of materials that can be potentially used in extreme temperature applications and have interesting properties such as hardness, toughness, and corrosion resistance. In particular, high entropy oxides have attracted attention due to intriguing properties such as colossal permittivity and superionic conductivity. Since high entropy oxides are achieved from entropy driven reaction so they undergo reversible phase transition from multiphase to single phase by sintering at high temperature. In this experimental work, we have shown that this is not the case for their magnetic properties. The magnetization of a sample resintered at 700oC after sintering at 1100oC was entirely different from the sample sintered at 700oC, but not sintered at 1100oC. The multiphase resintered sample's magnetization was very similar to the single-phase sample's magnetization. We have found that there is a close connection between the structural and magnetic properties which can explain the difference in magnetic behavior of multiphase samples.

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Session Classification: M3-5 Magnetism (DCMMP) | Magnétisme (DPMCM)

Track Classification: Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)