Contribution ID: **457** Type: **Contributed Oral Presentation**

Influence of ZnO and Dy2O3 on MgB2 Bulks Fabricated by High Temperature and Pressure Reaction

Monday 29 June 2015 17:00 (15 minutes)

Recently, ZnO and Dy2O3 have been considered as dopants for the improvement of superconducting properties in MgB2 bulks. However, the effect of these dopants is still unclear: some studies reported these metal oxides worked as new pinning centers and others was attributed the effects to Mg site substitution. In addition, low temperature reactions may explore limited solubility regimes for these dopants. In order to study the intrinsic effect of ZnO and Dy2O3 in MgB2, a high temperature sintering method has been used to fabricate dense and homogeneous MgB2 bulks. To do this we used an induction furnace built inside of a high pressure vessel which allowed us to reach 1700oC and 1500 Psi. A slow cooling rate (2oC/min) was used in an attempt to obtain a homogeneous nucleation and phase distribution. A series of MgB2 bulk samples with ZnO and Dy2O3 additives were synthesized through this high pressure and temperature procedures. The resulting microstructures of these bulk samples were revealed by SEM and TEM. Atomic substitution were evaluated by high resolution XRD. The upper critical field Bc2, irreversible field Birr and Tc were obtained from both magnetic and resistivity measurements. The roles of substitution vs precipitate induced strain on Bc2 enhancements with adding ZnO and Dy2O3 were discussed.

Primary author: YANG, Yuan (OSU)

Co-authors: Prof. COLLINGS, Edward (The Ohio State Univerisity); SUMPTION, Mike (The Ohio State University)

Presenter: YANG, Yuan (OSU)

Session Classification: M1OrD - Superconductor Materials I: Bulk and New Materials

Track Classification: ICMC-06 - HTS and MgB2 Bulk