
SESSION 11: Special Topics

Paper 11.1 Wednesday POSTER Session 1:15 to 2:45 PM

Effect of Containerless Melting and Solidification Process on HoAl₂ and HoB₂ Powders Using Electrode Induction Melting Gas Atomizer

H. Takeya, T.D Yamamoto, A.T Saito, T. Numazawa, Nat'l Inst. for Mat'ls Science, Tsukuba Japan

We have investigated the physical properties and atomization process of magnetic refrigerants such as HoAl₂ and HoB₂. Electrode induction melting gas atomization (EIGA) is a widely applied method to prepare those spherical powders. The EIGA process achieves melting and atomization completely without the use of a crucible and influences the morphologies and properties of those powders. In HoAl₂, we found a second phase of HoAl₃ in the HoAl₂ matrix, whose content is based on the quality of starting materials. In HoB₂, we observed the morphology and internal microstructure that depended on the starting composition of the electrode of HoB_{2-x}. This study provides those magnetocaloric properties and internal structures using the EIGA process. Powder sphericity and size distribution are also reported.