

The observation of macroscopic change for Bi-Mn alloy in high magnetic fields

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It has been found that magnetic field is effective for the synthesizing process of the materials, such as the reactions, nucleation and crystal growth, and so on [1,2]. The reactive-sintering of Bi-Mn was also influenced by magnetic fields [3]. For understanding of the magnetic field effect for synthesis of materials, *in-situ* observation is one of the important techniques. On the other hand, differential thermal analysis (DTA) is suitable method for observing the synthesis and decomposition. Recently, we developed the composite system of *in-situ* observation and thermal analysis for observing the synthesizing process in high magnetic fields [4]. In study, in order to investigate the magnetic field effect on the reaction process of Bi-Mn system in detail, we made a plan of *in-situ* observation with DTA for the reactive-sintering of Bi-Mn in a zero field and high magnetic fields up to 10 T.

A bulk sample was prepared using powders of Bi (4N) and Mn (4N). The powders were mixed and pressed in a metallic mold at the pressure of 15 MPa. The measurement was carried in the temperature range of 20 – 475°C.

Fig. 1 shows the result of the *in-situ* observation with DTA for the reactive-sintering process of Bi-Mn in a zero field. We succeeded in the *in-situ* observation with DTA for the reactive-sintering process of Bi-Mn in a zero field. In the presentation, the *in-situ* observation with DTA for the reactive-sintering process of Bi-Mn in magnetic fields will be reported.

References:

- [1] S. Awaji, *et al.*, J. Cryst. Growth, 226 (2001) 83-87.
- [2] R. Onodera, *et al.*, J. Alloy. Compd. 604 (2014) 8-11.
- [3] Y. Mitsui, *et al.*, J. Alloy. Compd. 615 (2014) 131-134.
- [4] D. Miyazaki, *et al.*, Abstract of Map6, (2014) 72.

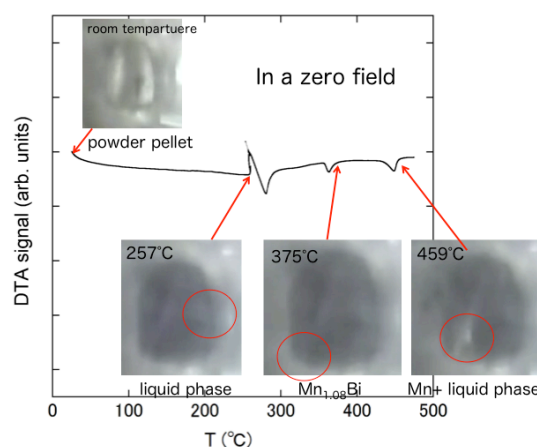


Fig. 1 In-situ observation with DTA for Bi-Mn in a zero field.