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비정질 $Fe_{90}Zr_{10}$의 자기 상전이

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Magnetic phase transition of amorphous $Fe_{90}Zr_{10}$

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The nature of the ferromagnetic transition of amorphous $Fe_{90}Zr_{10}$ has been controversial for some time. In this article, we report the measurements of the specific heat and the temperature coefficient of resistivity of a-$Fe_{90}Zr_{10}$ for the first time. We have used the ac modulation techniques to measure the specific heat and the temperature coefficient of resistivity. In the specific heat measurements, we have deposited an insulation layer and a heater directly on the sample and used the heater as a sensor simultaneously.[1] To measure the temperature coefficient of resistivity, we have glued a sample on the one side of a sapphire substrate and gave the temperature oscillation to the substrate. Then we have measured the resistance oscillation caused by the temperature oscillation of the substrate.

The specific heat shows a broad peak around T_c contrary to the singularity often found in the ferromagnetic transition of the pure system. The temperature coefficient of resistivity shows a slope change at T_c. These measurements indicate that the ferromagnetic transition in a-$Fe_{90}Zr_{10}$ is characteristically different from the conventional one, with a diverging correlation length, in pure systems.

[1] D. H. Jung et al., Meas. Sci. Technol. **3**, 475 (1992)