Abstract Submitted
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A NiCrAl pressure cell up to 4.6 GPa and its application to cuprate and pnictide superconductors[1] NAOKI FUJIWARA, Kyoto University, YOSHIYA UWATOKO, University of Tokyo, TAKEHIKO MATSUMOTO, National Institute for Material Science — A NiCrAl-CuBe hybrid cell has been paid much attention because its maximum pressure goes beyond 3 GPa despite its large sample space. In the previous pressurizing trials for this pressure cell, we reached 4.0 GPa under a steady load of 15 ton. In the present trial, we have succeeded in reaching 4.6 GPa by using a short Teflon capsule as a pressure-mediation-liquid container. The pressure efficiency at 15 ton was 75%. The maximum expansion of the inner diameter of the NiCrAl cylinder was 5%, suggesting that 4.6 GPa is the upper limit of pressure. To keep high pressure above 4 GPa, a steady load control is needed: a pressure of 4.0 GPa under a steady load decreased to 3.7 GPa after the pressure cell was clamped and the steady load was released. The pressure cell is available to various experiments that need a large sample space. We have applied this pressure cell to nuclear magnetic resonance (NMR) measurements on cuprate and pnictide superconductors, such as $Sr_2Ca_{12}Cu_{24}O_{41}$, $LaFeAsO_{1-x}F_x$, and $CaFe_{1-x}Co_xAsF$. These compounds have superconducting layers, and T_cs of these compounds are enhanced by pressure application. We review what happens at optimal pressure in electric and/or magnetic properties on a microscopic level.

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