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Pressure Effect on Superconductivity of Rhenium KAZUSHI TAKAHAMA, TAKAHIRO MATSUOKA, KATSUYA SHIMIZU, KYOKUGEN, Osaka Univ., Japan — Rhenium metal is often used as a gasket material in high pressure experiments using DACs. It has been known that Re become a superconductor with superconducting transition temperature T_c of 1.6-2.8 K at ambient pressure [1]. Although, pressure dependence of T_c , have not been studied in detail over 2 GPa [1]. It's important to study pressure effect on T_c of Re in two points. First is that hard simple elements Os, W, Ir and Re are known to superconduct with very low T_c s at ambient pressure, but high pressure properties of their T_c have not been well studies so far. Another point is a technical aspect. In the studies of superconductivity under high pressures, we employ electrical resistance and magnetic susceptibility measurements to detect superconductivity. Superconducting Re-gasket below 4 K masks superconducting signal of sample in magnetic susceptibility measurements. In electrical resistance measurements, if the electric circuit has a short with Re-gasket, superconducting transition comes to be mixed in measured data. We present pressure dependence of T_c of rhenium up to 65 GPa measured using a DAC. We observed T_c increases in pressure range of 0-10 GPa and it gradually decreased with applied pressure.

[1] C.W. Chu et al., Phys. Rev. Lett. 20, 198 (1968)

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