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Systematic enhancement in magnetic susceptibilities and a study of Fermi Liquid behaviour of ReT_2Al_{10} where Re=Y and La, and T =Fe, Ru, and Os[1] KEESEONG PARK, YURI JANSSEN, MOOSUNG KIM, Brookhaven National Laboratory, CARLOS MARQUES, Stony Brook University, MEIGAN ARONSON, Brookhaven National Laboratory — DC and AC magnetic susceptibilities, specific heat and resistivity are measured for $YbFe_2Al_{10}$-structure compounds, ReT_2Al_{10} where Re =Y, and La, and T = Fe, Ru, and Os. The YT_2Al_{10} show systematically enhancing paramagnetic behavior in magnetic properties from Os to Ru and to Fe, and Fermi-liquid behaviour below around 100 K. With the linear term of the specific heat (γ_0) and the temperature independent susceptibility (χ_0) at low temperature, the Stoner enhancement parameter, Z, is utilized to find how close the compounds are to the ferromagnetic ordering, where Z = 1-$(3\mu_B^2/\pi^2 k_B^2)(\gamma_0/\ \chi_0)$. Specifically, YFe_2Al_{10} shows a larger Z (0.98) than that (0.83) of Pd, a well known example of nearly ferromagnetic materials. The implied proximity to the quantum criticality is tested by a power law analysis , where $1/(\chi - \chi_0)$=AT^{λ} can describe well a wide range (2K to 100K) of AC magnetic susceptibility for YFe_2Al_{10} with λ = 1.19, which is between the mean-field value ($\lambda = 1$) and that of the three-dimensional Ferromagnetic Heisenberg model ($\lambda = 1.33$).

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