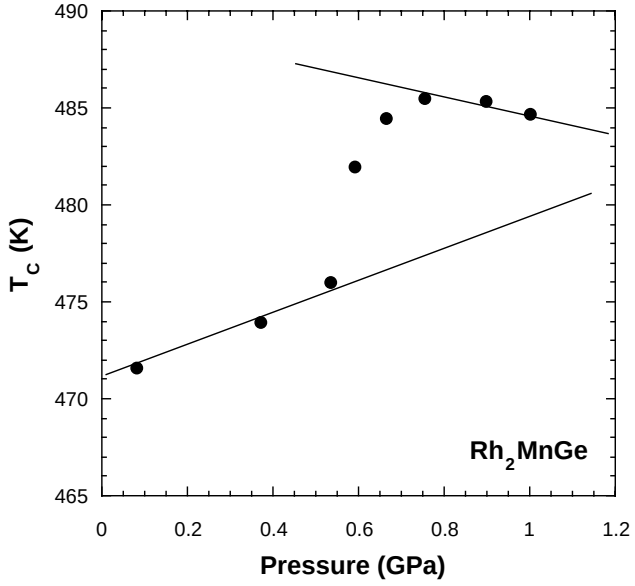


Fig. 4. Pressure dependence of the Curie temperature $T_C$ for $Rh_2MnGe$.

1 GPa. The Curie temperature was determined by using the same method as for $Rh_2MnSn$. The pressure dependence of $T_C$ is shown in Fig. 4. The Curie temperature increases linearly with pressure at first, steeply increases around 0.6 GPa, and then decreases above 0.8 GPa. The Curie temperature was estimated to be 471 K at normal pressure. These results suggest that there occurs the pressure induced phase transition around 0.6 GPa ($= P_t$). The pressure coefficient of the Curie temperature is estimated to be $(1/T_C)dT_C/dp = +1.7 \times 10^{-2}\,GPa^{-1}$ below the transition pressure $P_t$ and $(1/T'_C)dT_C/dp = -1.0 \times 10^{-2}\,GPa^{-1}$ above $P_t$, where $T'_C$ is the Curie temperature of the pressure induced phase.

The results for $Rh_2MnSn$ and $Rh_2MnGe$ below $P_t$ can be understood qualitatively on the basis of the dependence of the exchange interaction on the Mn–Mn distance in the same manner, as it has been assumed by Kanomata et al. [4] for $Ni_2MnX$ (X = Al, Ga, In, Sn), since both Mn–Mn distances, 4.41 Å in $Rh_2MnSn$ and 4.26 Å in $Rh_2MnGe$ are larger than those in $Ni_2MnX$. There have been proposed so-called interaction curves showing the relationship between $T_C$ and the Mn–Mn interatomic distance $R$ by Yamada [5] and Castelliz [6]. According to Yamada's proposition, the interaction curve has the maximum around $R = 3.5$ Å. This suggests that the pressure coefficient is negative for the alloys with $R < 3.5$ Å. On the other hand, it was recently found that several Heusler alloys like $Ni_2MnGa$ show a crystallographic transition (martensite transition) and that the crystallographic and magnetic transitions have a close relation to each other [7]. If we assume that $Rh_2MnGe$ transforms into a ferromagnetic alloy with smaller $R$ at the critical pressure $P_t$ by a pressure induced crystallographic transition, the negative pressure coefficient of the Curie temperature for $Rh_2MnGe$ above $P_t$ can be ascribed to that of the Curie temperature $T'_C$ for a new ferromagnetic phase induced by pressure. Thus, it is interesting to examine whether there occurs a crystallographic transformation at $P_t$. X-ray diffraction measurements under pressure are now in progress to reveal the pressure induced phase transition of $Rh_2MnGe$.

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