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**Weak Fermi Level Pinning Effect in Schottky Junction of $\alpha$-$MoTe_2$** SHU NAKAHARAI, MAHITO YAMAMOTO, Natl Inst for Materials Sci, KEIJI UENO, Saitama Univ, KAZUHITO TSUKAGOSHI, Natl Inst for Materials Sci — Difficulty in hole injection from metal contacts to transition metal dichalcogenide (TMDC) semiconductors has been one of the most serious issues in the application of these 2D materials to future nanoelectronics, which is caused by the strong Fermi level pinning effect in the metal/TMDC Schottky junction. In this work, we found that the holes can be injected efficiently from a large work function metal of Pt to $\alpha$-molybdenum ditelluride ($\alpha$-$MoTe_2$; 2H-type), a TMDC semiconductor. The Schottky barrier height for holes at the Pt/$\alpha$-$MoTe_2$ interface was extracted to be 40 meV by the temperature dependence of back-gate modulated currents under the flat band condition at the junction, while the Schottky barrier for electrons in the junction with a small work function metal of Ti was found to be 50 meV. Considering the difference in the work functions of Pt and Ti, the Fermi level pinning effect in $\alpha$-$MoTe_2$ was found to be much weaker than that in other TMDC semiconductors such as $MoS_2$. These results open a way to the realization of complementary type circuits in the 2D materials for future low-power consumption electronics. This work was supported by JSPS KAKENHI Grant Numbers 15K06006, 25107004.

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