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Optimization of thermoelectric power factor in ion-gated ultrathin WSe2 single crystals YIJIN ZHANG, MASARO YOSHIDA, TAKAHIKO IIZUKA, RYUJI SUZUKI, YOSHIHIRO IWASA, Department of Applied Physics, The University of Tokyo, SUNAO SHIMIZU, RIKEN Center for Emergent Matter Science — We report an electric field tuning of the thermopower in ultrathin WSe2 single crystals over a wide range of carrier concentration by using electric double-layer (EDL) technique. We fabricated a micro-sized EDL transistor with on-chip heaters and thermometers for an ultrathin flake of WSe2. We succeeded in the optimization of power factor not only in the hole but also in the electron side, which has never been chemically accessed. The maximized values of power factor are one-order larger than that obtained by changing chemical composition, reflecting the clean nature of electrostatic carrier doping.

Yijin Zhang
Department of Applied Physics, The University of Tokyo

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