Supporting Information

Correlation between Seebeck coefficients and electronic structures of nitrogen- or boron- doped reduced graphene oxide via thermally activated carrier transport

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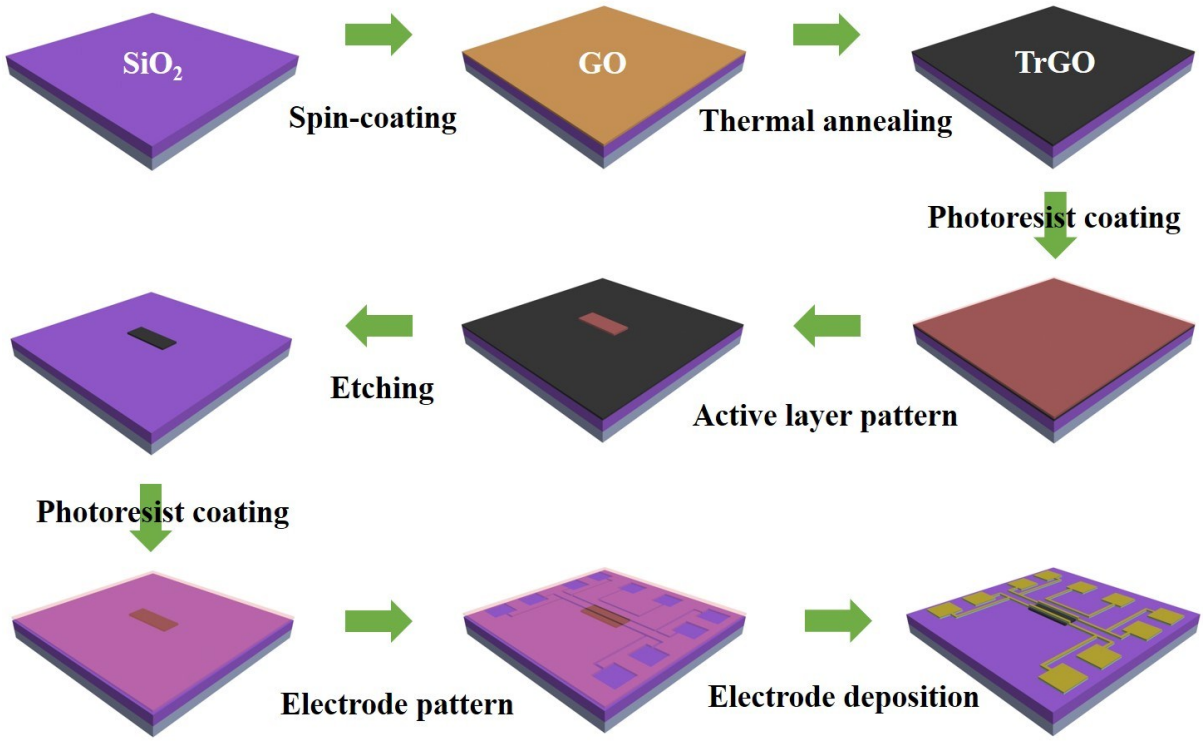

Figure S1. Schematic illustration of preparing active layer and electro patterned devices for gate dependent Seebeck coefficient measurement

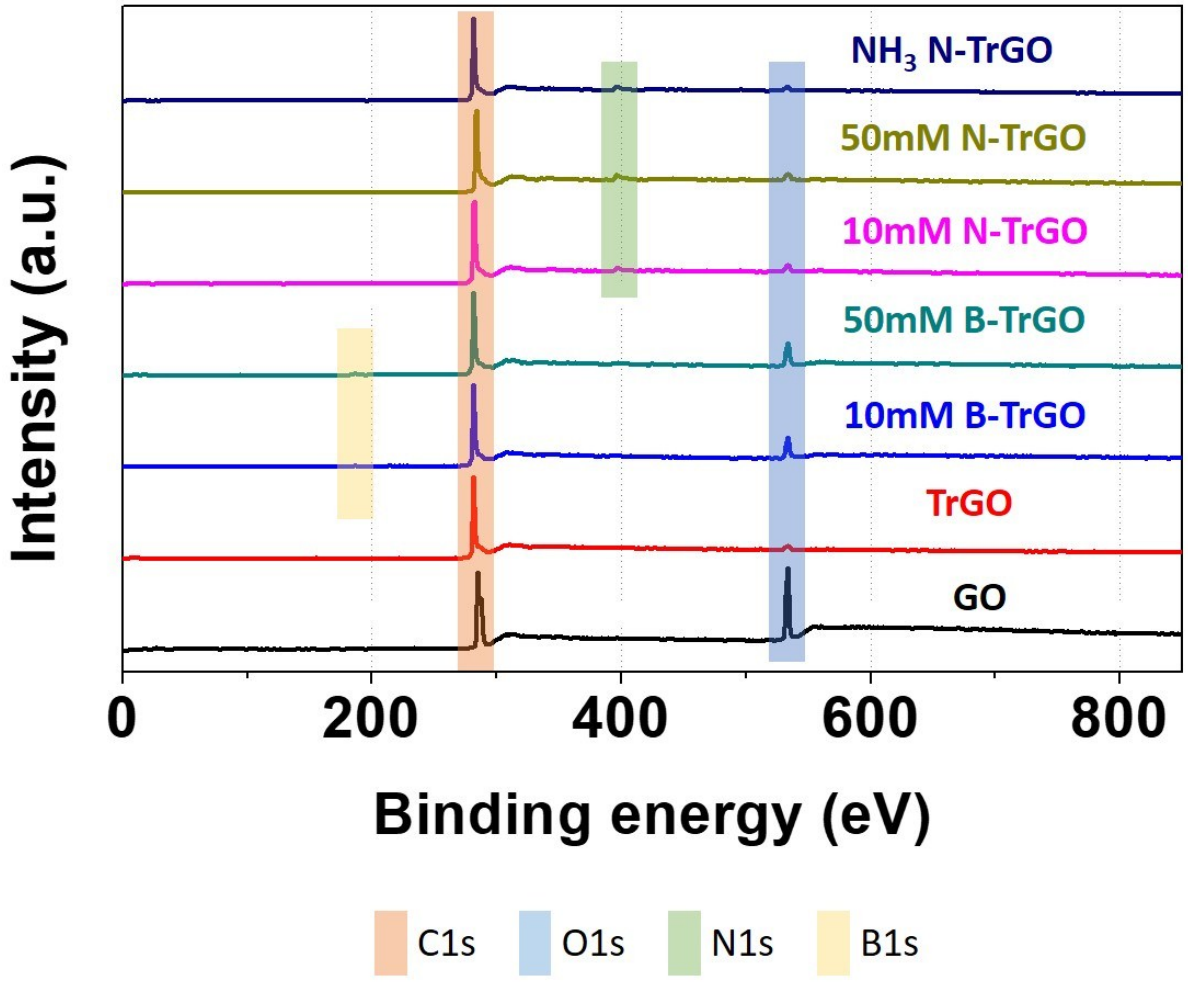

Figure S2. XPS spectra of GO, TrGO, 10 mM B-TrGO, 50 mM B-TrGO, 10 mM N-TrGO, 50 mM N-TrGO, and NH_3 N-TrGO

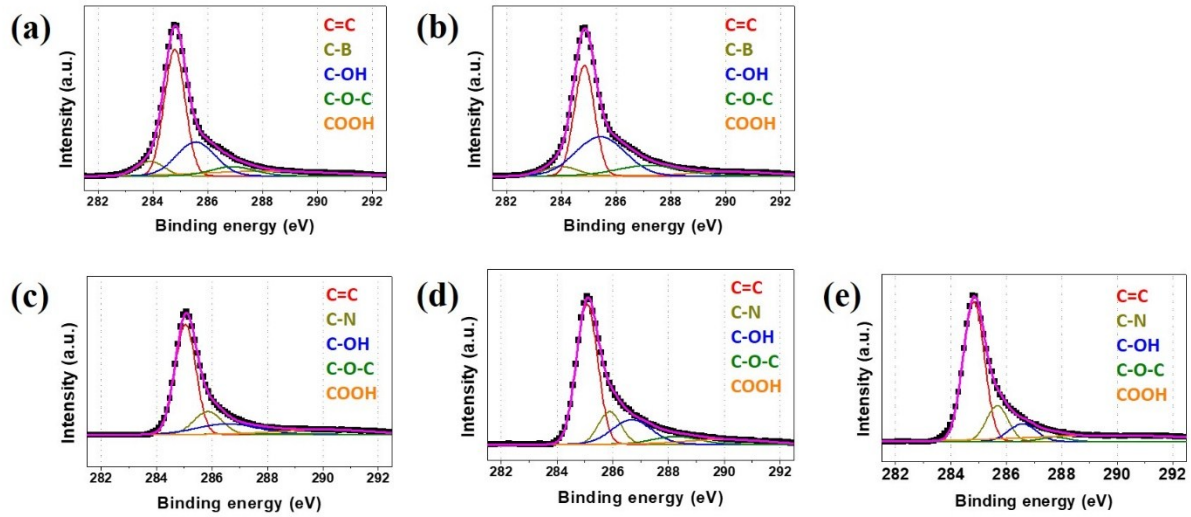

Figure S3. C1s spectra of (a) 10 mM B-TrGO, (b) 50 mM B-TrGO, (c) 10 mM N-TrGO, (d) 50 mM N-TrGO, and (e) NH_3 N-TrGO

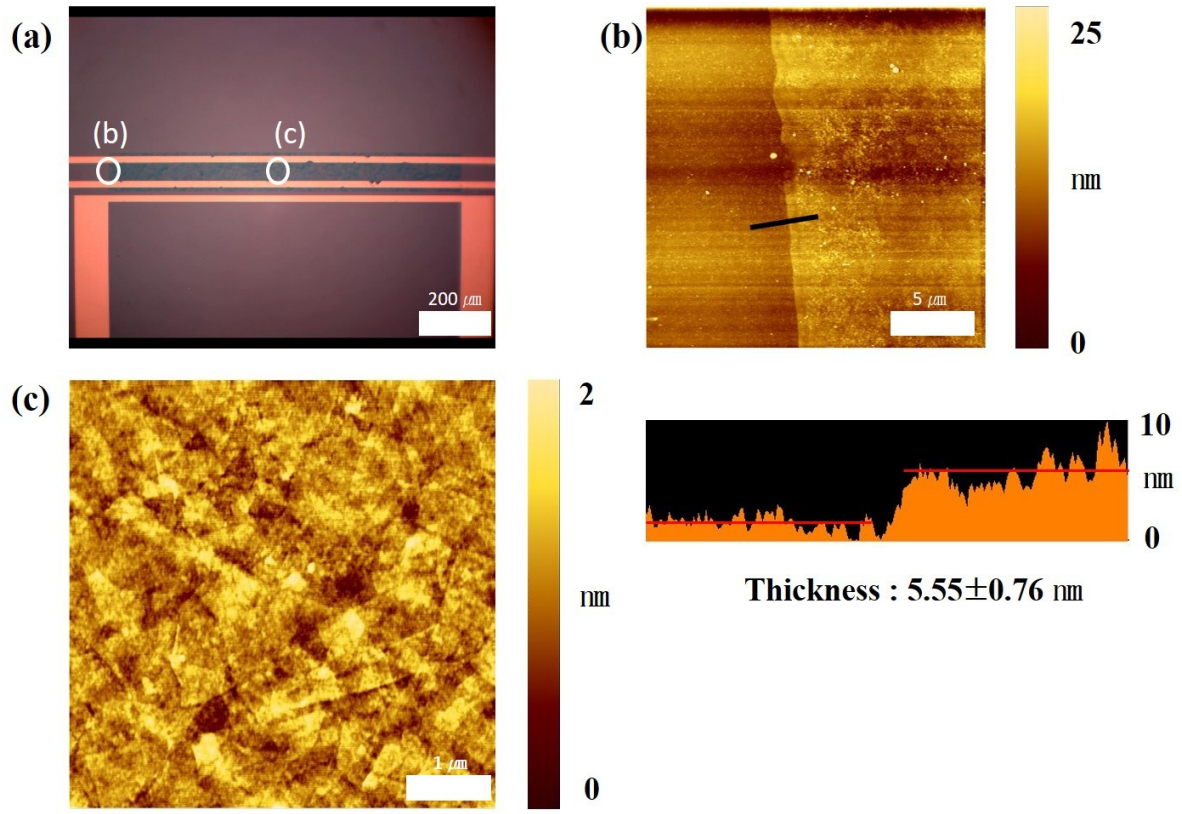

Figure S4. (a) optical image of the TrGO device, and AFM image of (b) left side in TrGO, and (c) center in TrGO

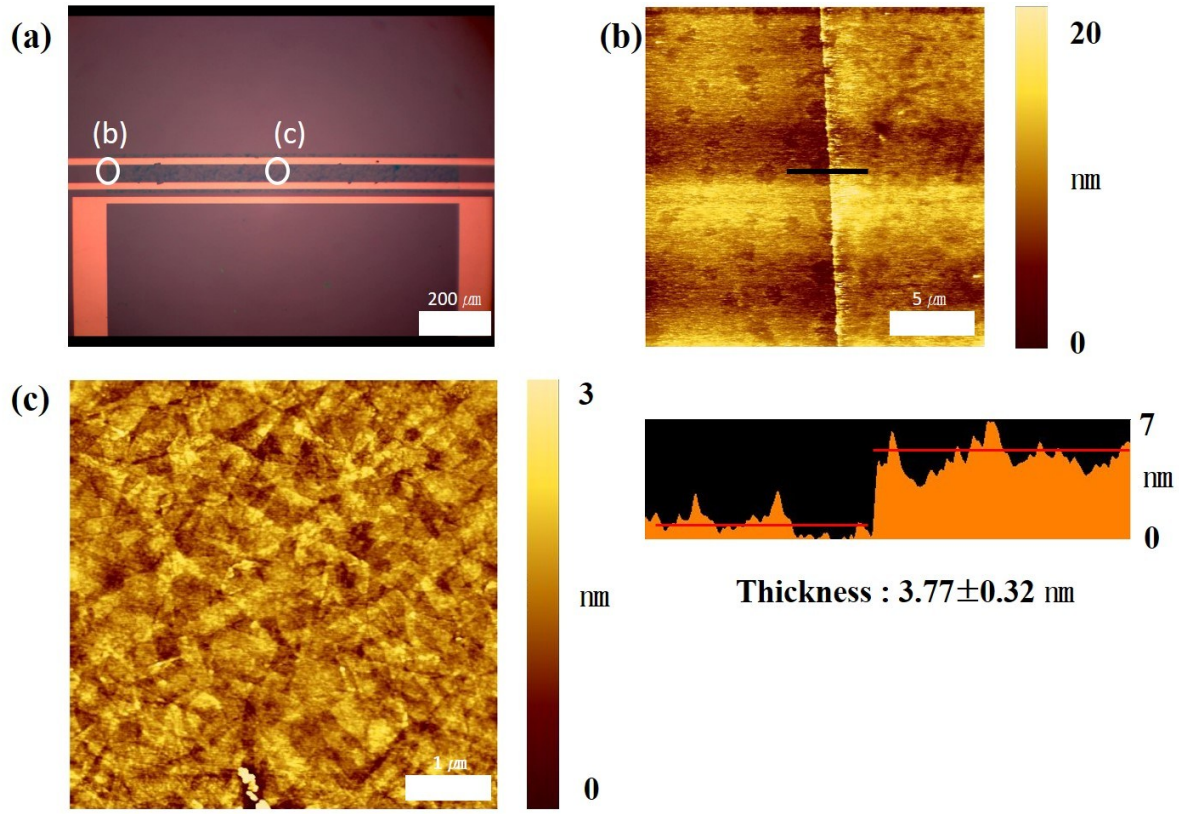

Figure S5. (a) optical image of the 10 mM B-TrGO device, and AFM image of (b) left side in 10 mM B-TrGO, and (c) center in 10 mM B-TrGO

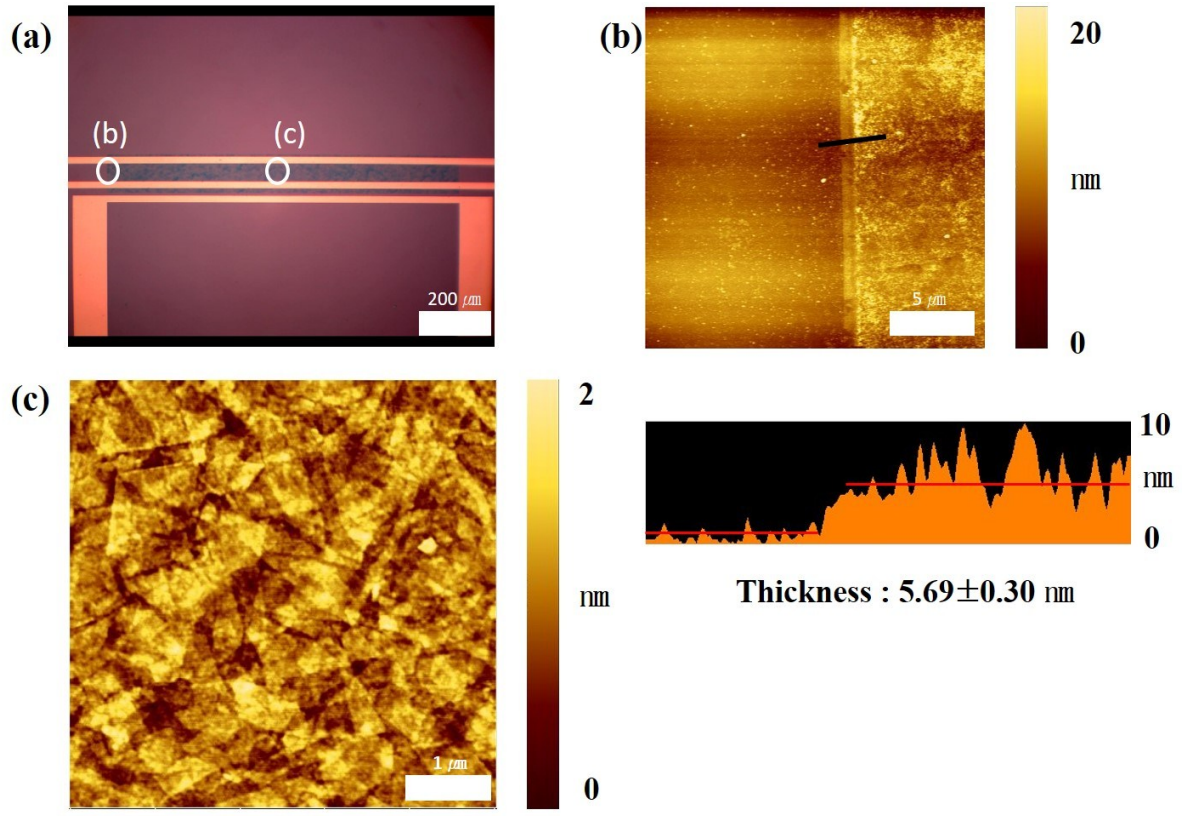

Figure S6. (a) optical image of the 50 mM B-TrGO device, and AFM image of (b) left side in 50 mM B-TrGO, and (c) center in 50 mM B-TrGO

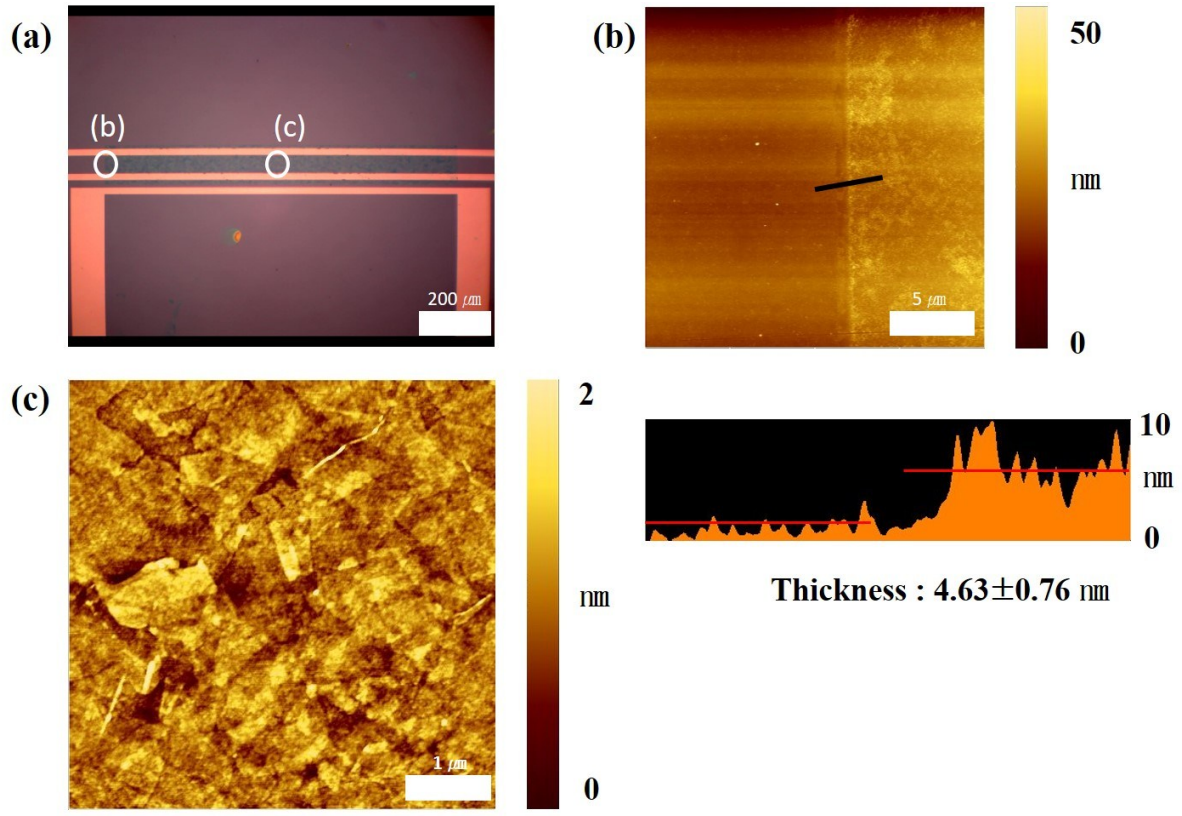

Figure S7. (a) optical image of the 10 mM N-TrGO device, and AFM image of (b) left side in 10 mM N-TrGO, and (c) center in 10 mM N-TrGO

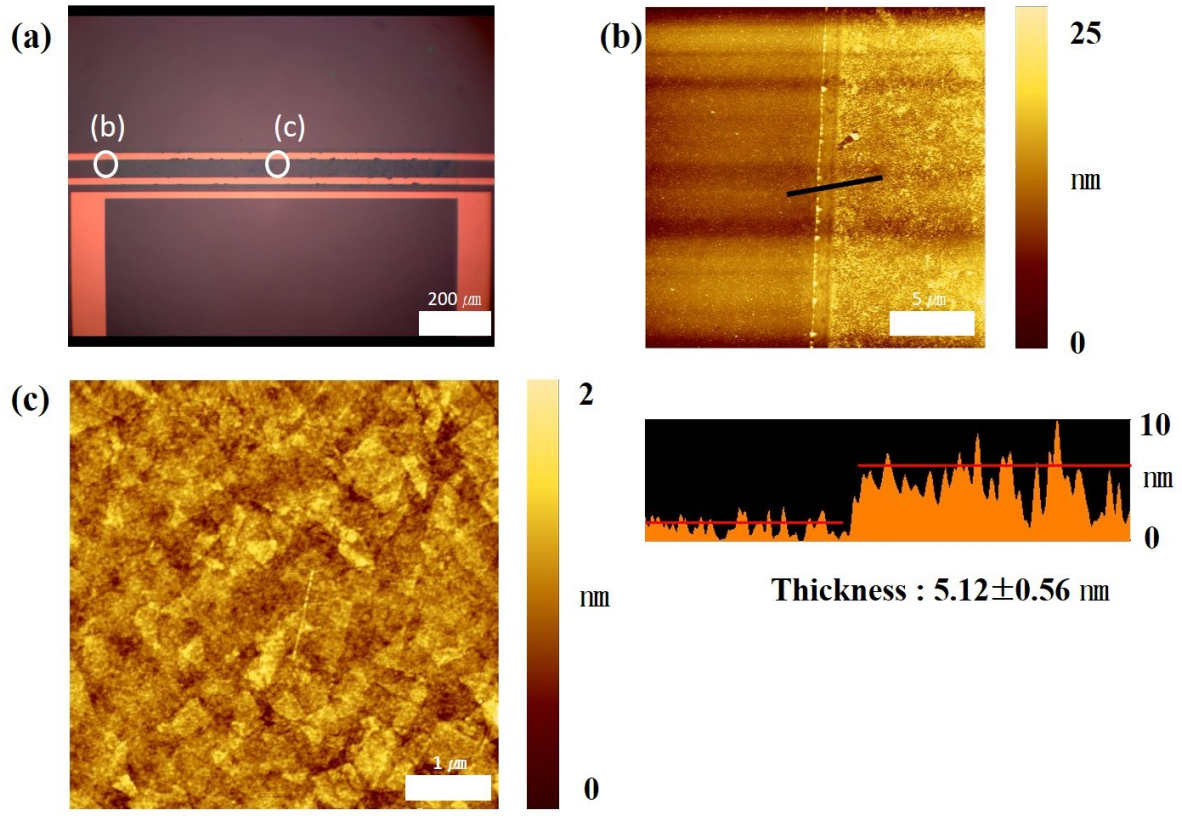

Figure S8. (a) optical image of the 50 mM N-TrGO device, and AFM image of (b) left side in 50 mM N-TrGO, and (c) center in 50 mM N-TrGO

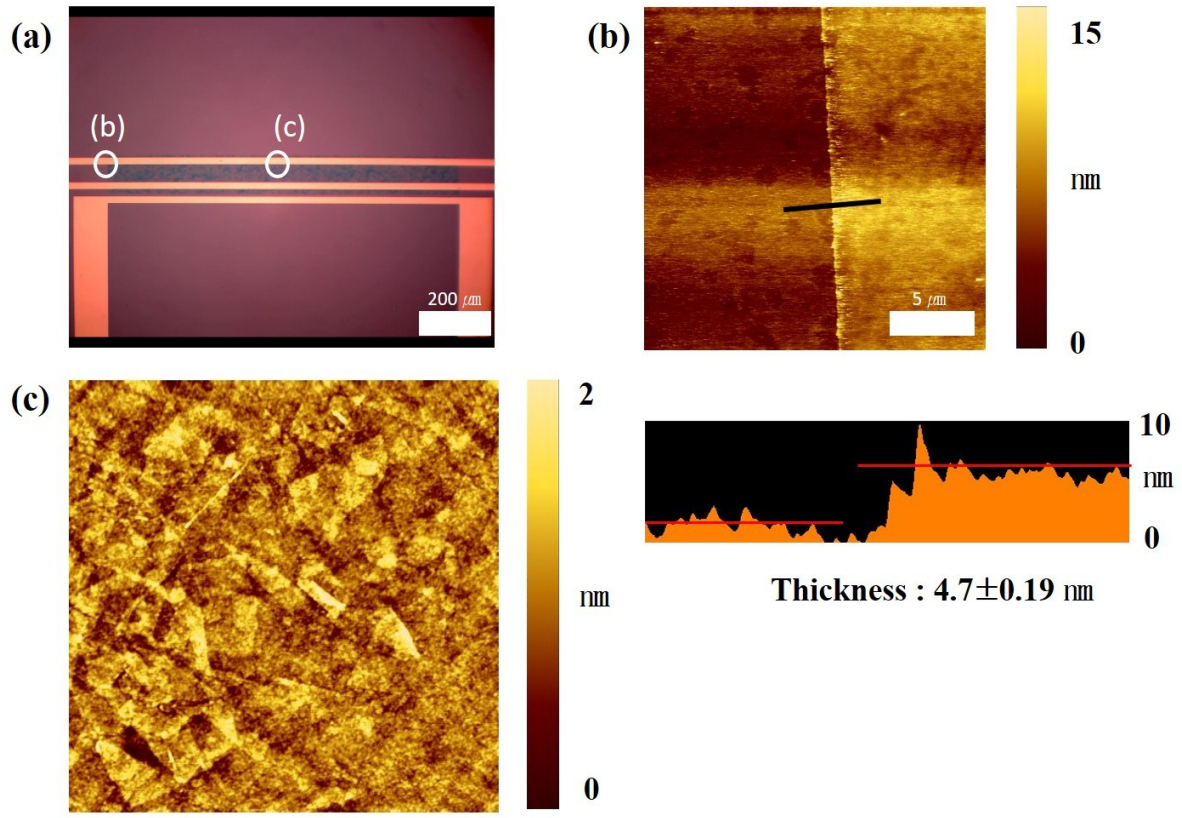

Figure S9. (a) optical image of the NH_3 N-TrGO device, and AFM image of (b) left side in NH_3 N-TrGO, and (c) center in NH_3 N-TrGO

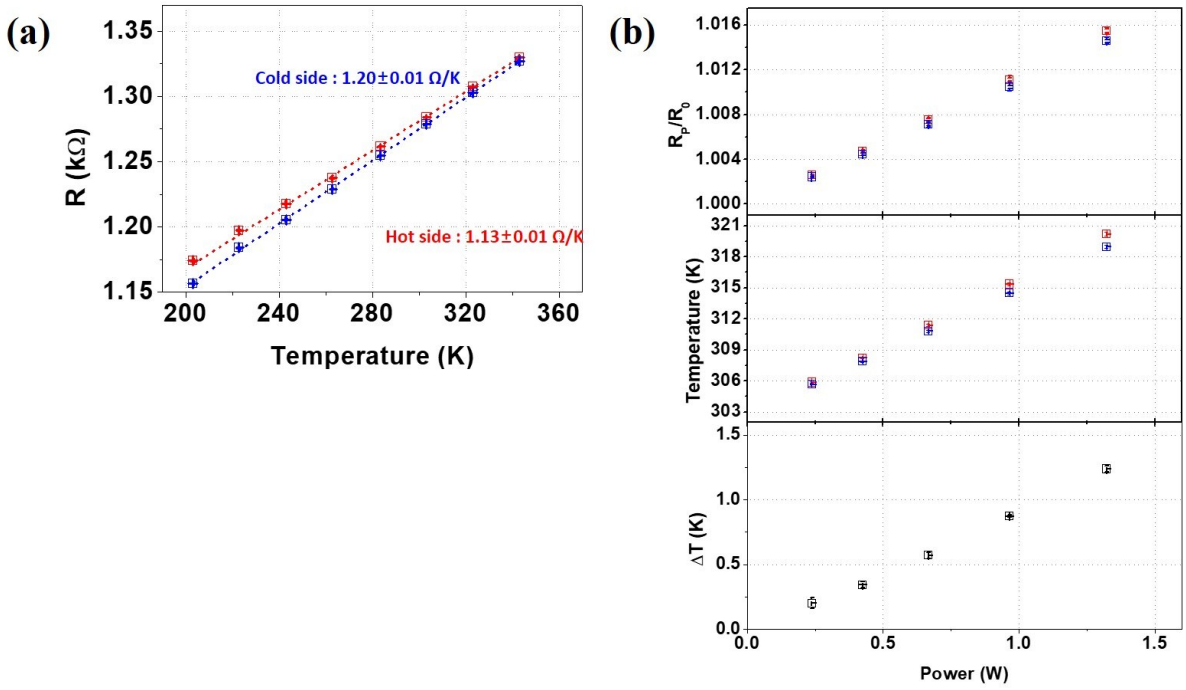

Figure S10. (a) temperature coefficient of resistance (TCR) of 10 mM B-TrGO, (b) resistance gradient of hot side (red open square) and cold side (blue open square) (top), temperature of hot side and cold side (middle), and temperature gradient of 10 mM B-TrGO as a function of heater power

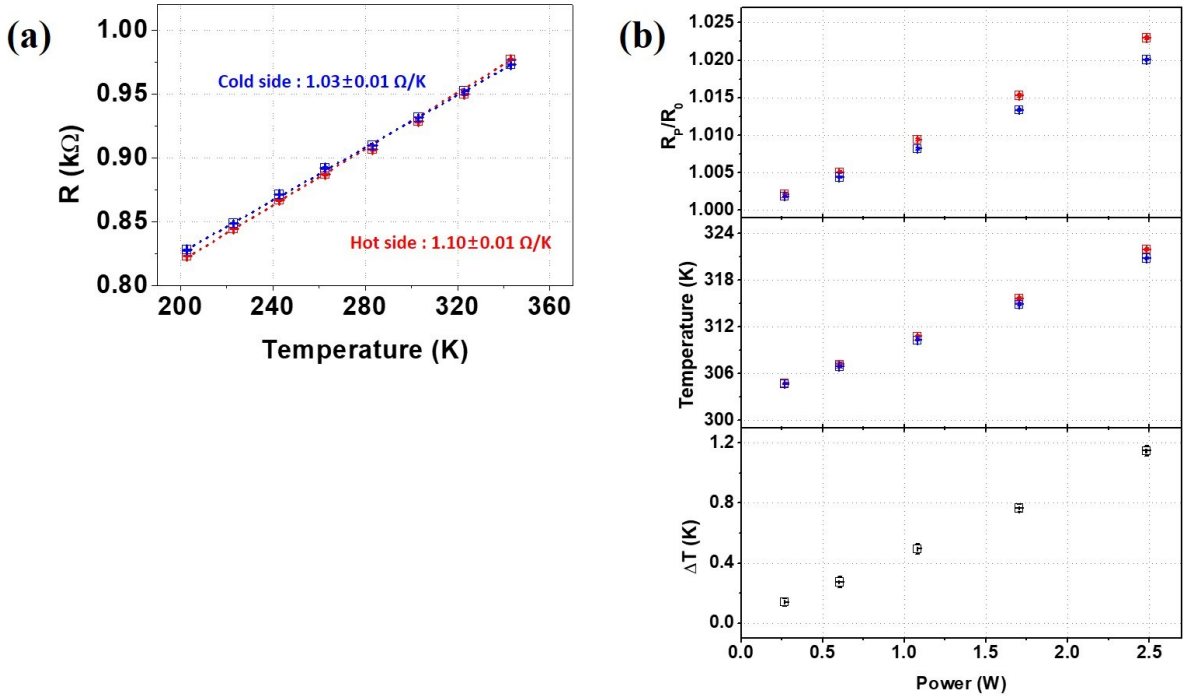

Figure S11. (a) temperature coefficient of resistance (TCR) of 50 mM B-TrGO, (b) resistance gradient of hot side (red open square) and cold side (blue open square) (top), temperature of hot side and cold side (middle), and temperature gradient of 50 mM B-TrGO as a function of heater power

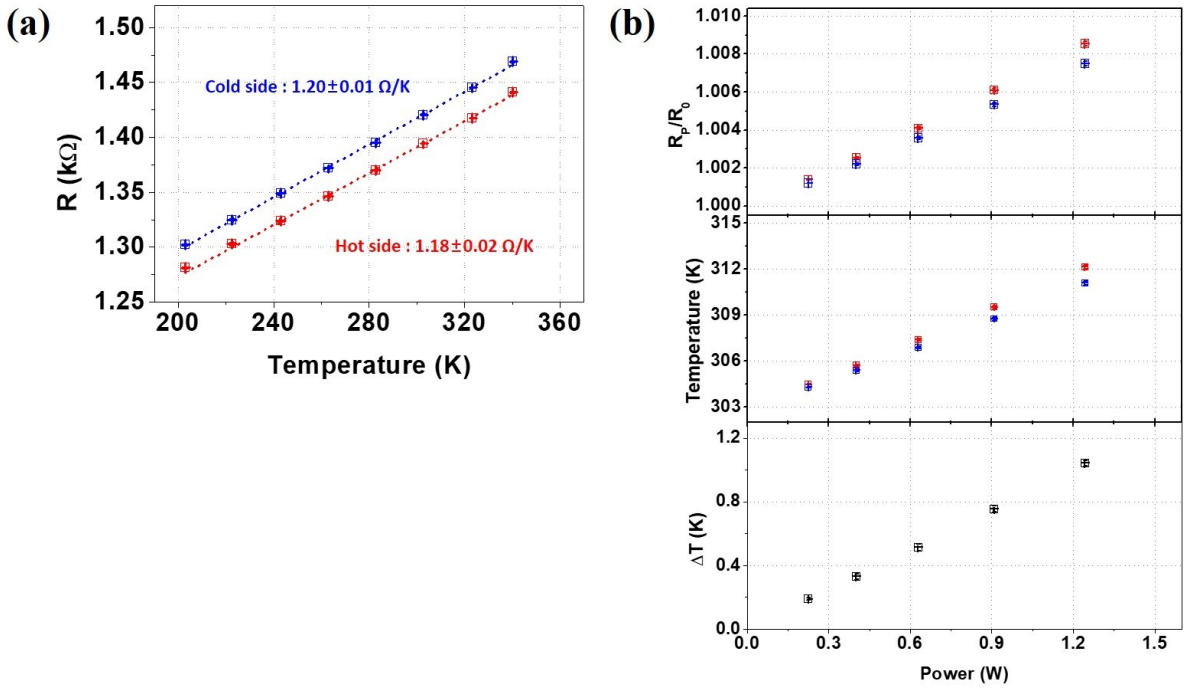

Figure S12. (a) temperature coefficient of resistance (TCR) of 10 mM N-TrGO, (b) resistance gradient of hot side (red open square) and cold side (blue open square) (top), temperature of hot side and cold side (middle), and temperature gradient of 10 mM N-TrGO as a function of heater power

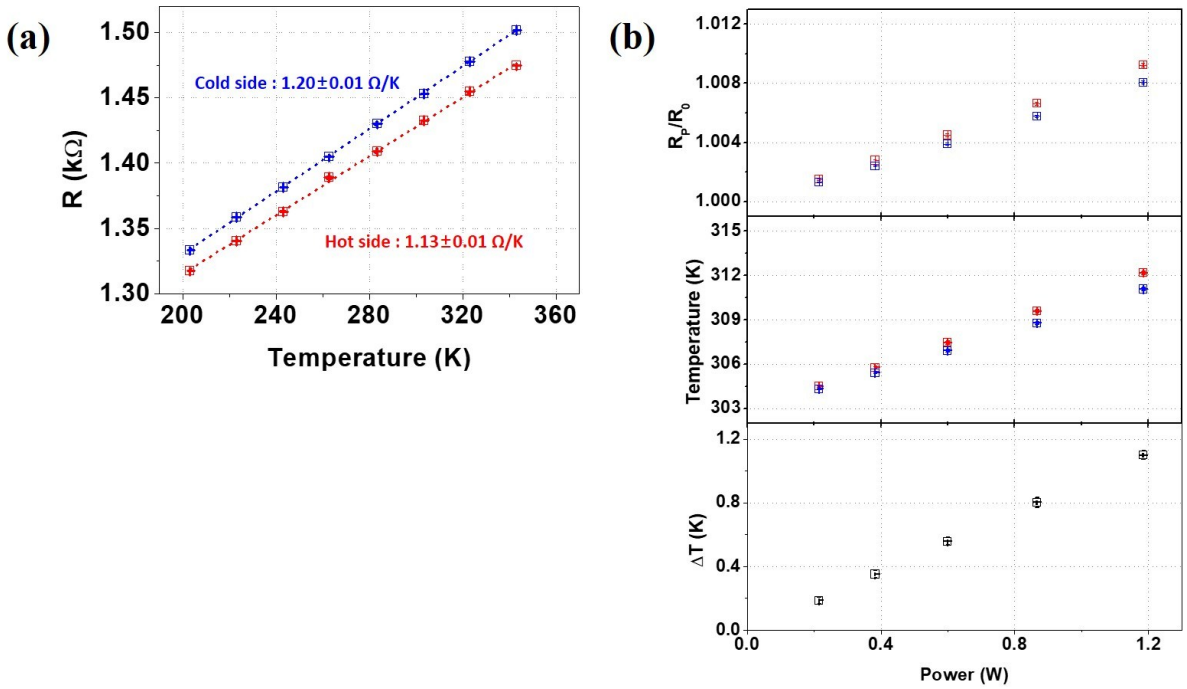

Figure S13. (a) temperature coefficient of resistance (TCR) of 50 mM N-TrGO, (b) resistance gradient of hot side (red open square) and cold side (blue open square) (top), temperature of hot side and cold side (middle), and temperature gradient of 50 mM N-TrGO as a function of heater power

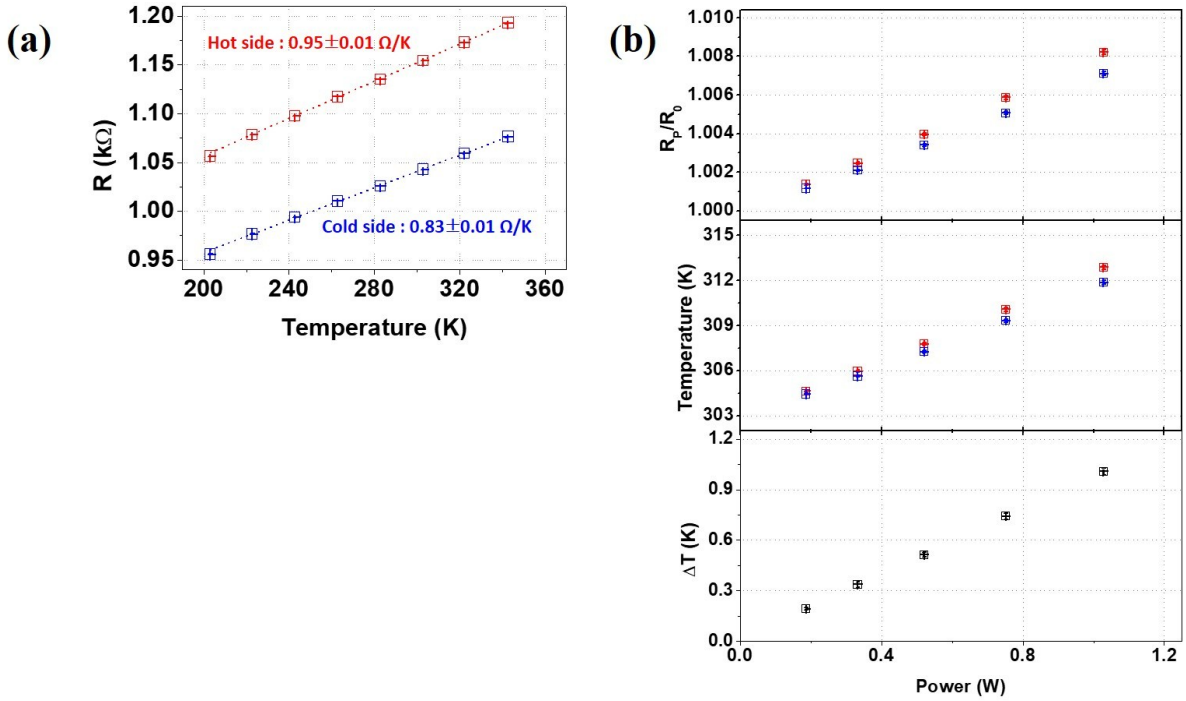

Figure S14. (a) temperature coefficient of resistance (TCR) of NH_3 N-TrGO, (b) resistance gradient of hot side (red open square) and cold side (blue open square) (top), temperature of hot side and cold side (middle), and temperature gradient of NH_3 N-TrGO as a function of heater power

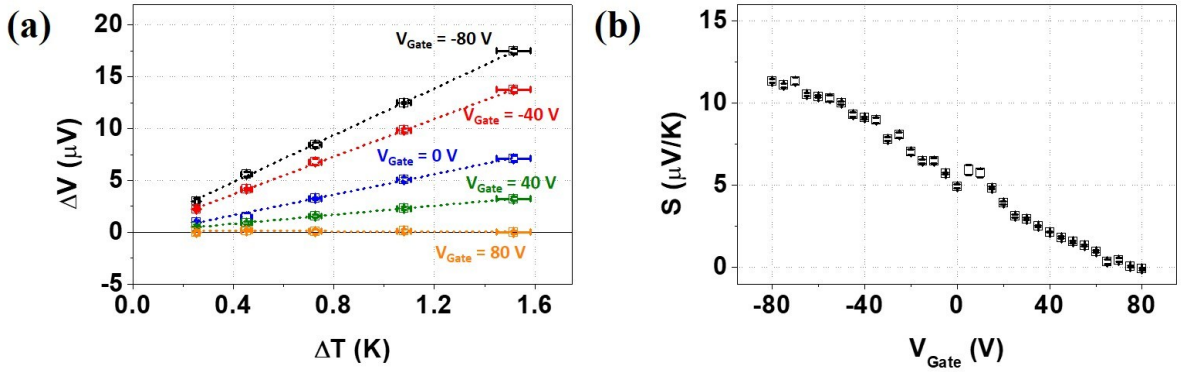

Figure S15. (a) Example of linear fitting for Seebeck coefficient with 10 mM B-TrGO with V_{Gate}= -80, -40, 0, 40, and 80 V, (b) gate dependent Seebeck coefficient of 10 mM B-TrGO

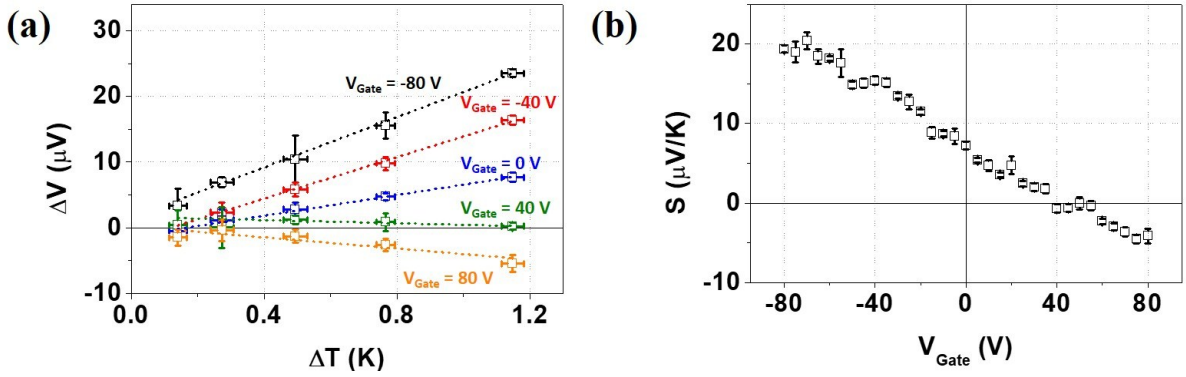

Figure S16. (a) Example of linear fitting for Seebeck coefficient with 50 mM B-TrGO with V_{Gate}= -80, -40, 0, 40, and 80 V, (b) gate dependent Seebeck coefficient of 50 mM B-TrGO

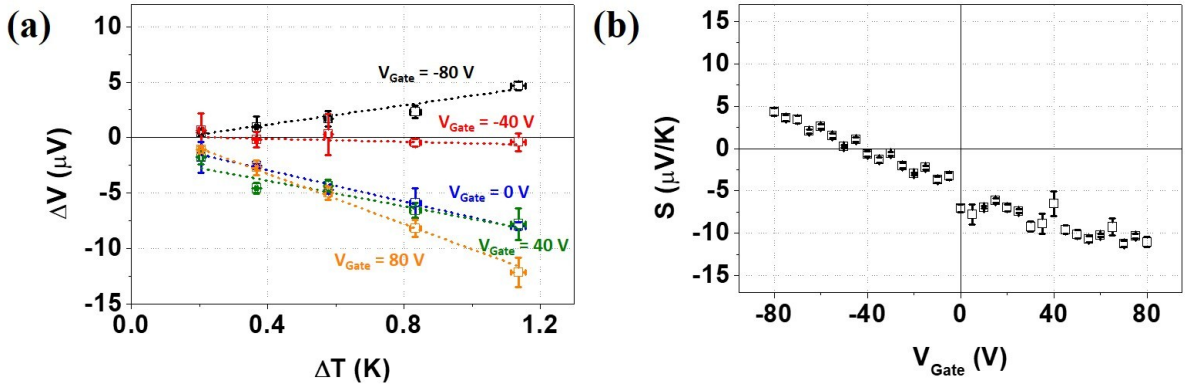

Figure S17. (a) Example of linear fitting for Seebeck coefficient with 10 mM N-TrGO with V_{Gate}= -80, -40, 0, 40, and 80 V, (b) gate dependent Seebeck coefficient of 10 mM N-TrGO

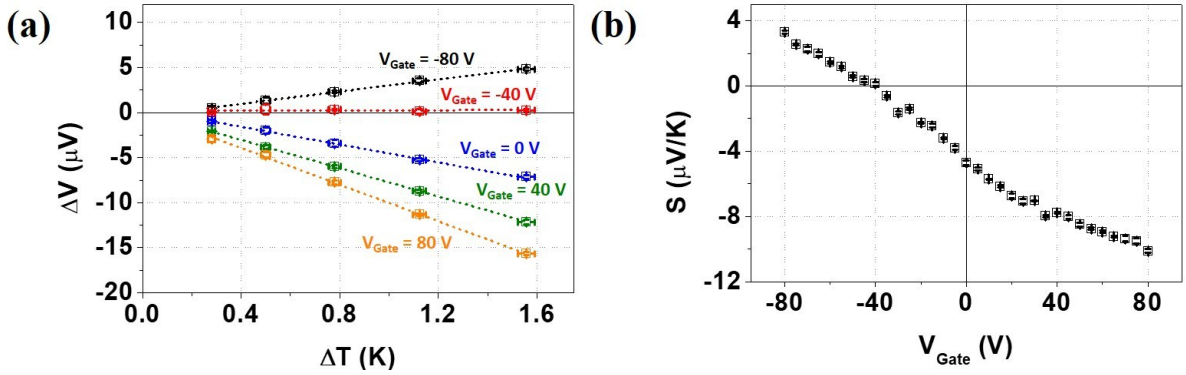

Figure S18. (a) Example of linear fitting for Seebeck coefficient with 50 mM N-TrGO with V_{Gate}= -80, -40, 0, 40, and 80 V, (b) gate dependent Seebeck coefficient of 50 mM N-TrGO

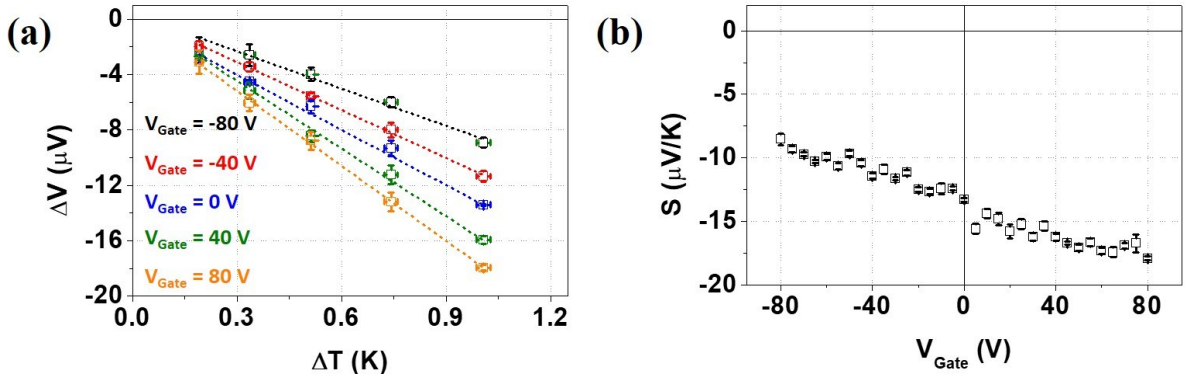

Figure S19. (a) Example of linear fitting for Seebeck coefficient with NH_3 N-TrGO with V_{Gate}= -80, -40, 0, 40, and 80 V, (b) gate dependent Seebeck coefficient of NH_3 N-TrGO