Table S1.
Comparison of the sensitivities of ion sensors

Company/ Research Gr.	Sensor	Sensitivity
CNM(Institute of Microelectronics of Barcelona IMB-CNM)	pH-ISFET	≥ 55mV/pH
Vernier Software & Technology	K^+-ISE	56 ± 4 mV/pK
Wang et al. [1]	pH-ISFET	46 mV/pH
Truong et al. [2]	pH-ISFET	50 mV/pH
Alifragis et al. [3]	K^+-ChemHEMT	52.4 mV/pK

[1] B. Wang, K. L. Liddell, J. Wang, B. Koger, C.D. Keating and J. Zhu, Oxide-on-graphene field effect bio-ready sensors, Nano Research 7, 2014, No. 9, 1263-1270.
[2] T. K. Truong, T. N. Nguyen, T. Q. Trung, I. Y. Sohn, D. J. Kim, J. H. Jung, N. E. Lee, Reduced graphene oxide field-effect transistor with indium tin oxide extended gate for proton sensing, Current Applied Physics, 2014, 14(5), 738-43.
[3] Y. Alifragis, A. Volosirakis, N. A. Chaniotakis, G. Konstantinidis, A. Adikimenakis and A, Georgakilas, Potassium selective chemically modified field effect transistors based on AlGaN/GaN two-dimensional electron gas heterostructures. Biosensors and Bioelectronics, 2007, 22(12), 2796-2801.

Figure S1, Li *et al.*

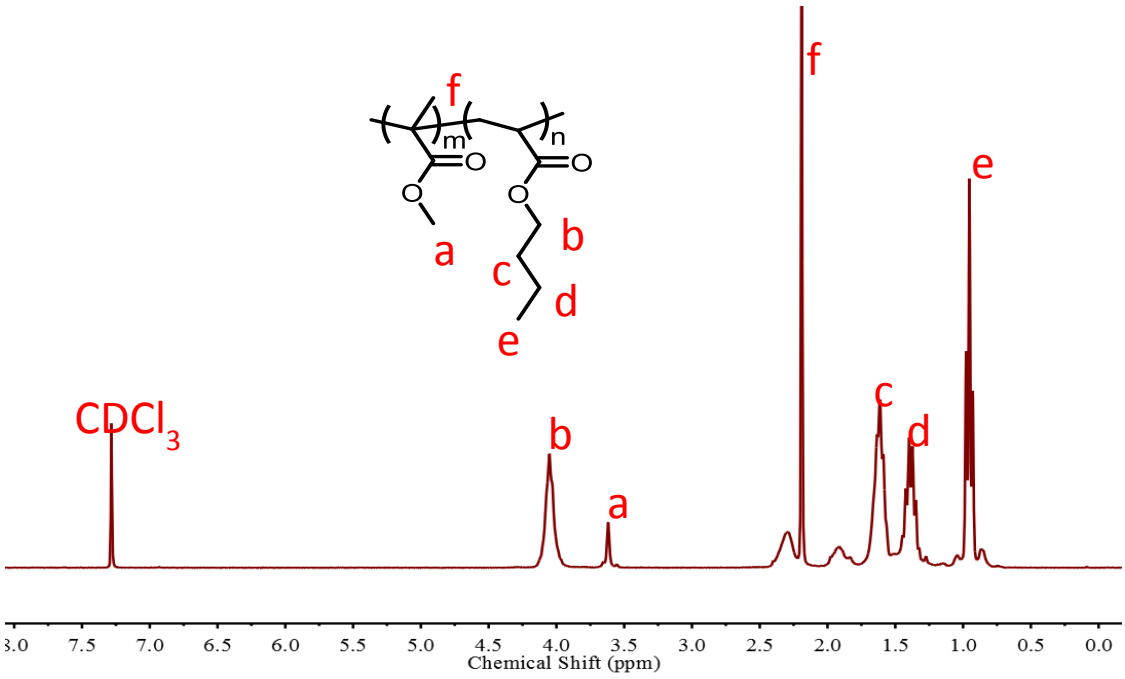

Fig. S1: ^{1}H NMR spectrum of methacrylate and n-butylacrylate copolymer.

Figure S2, Li *et al.*

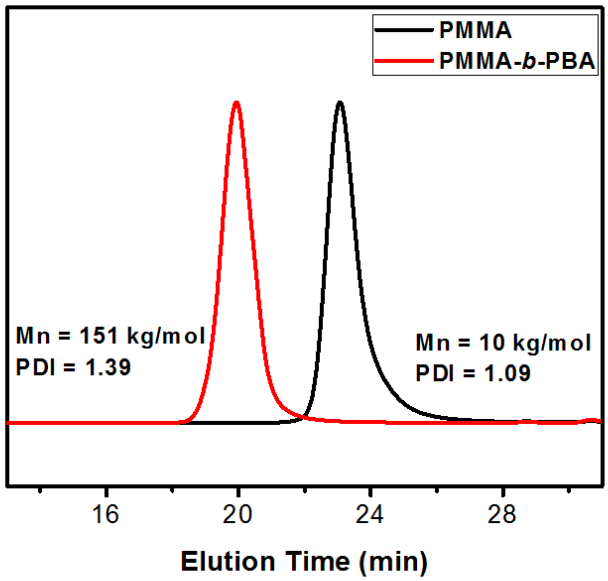

Fig. S2: GPC (gel permeation chromatography) traces of methacrylate and n-butylacrylate copolymer.

Figure S3, Li *et al.*

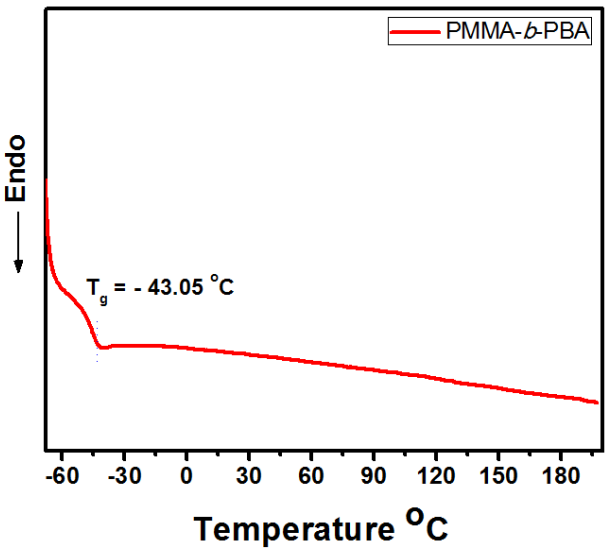

Fig. S3: DSC (differential scanning calorimetry) profile of methacrylate and n-butylacrylate copolymer.

Figure S4, Li *et al.*

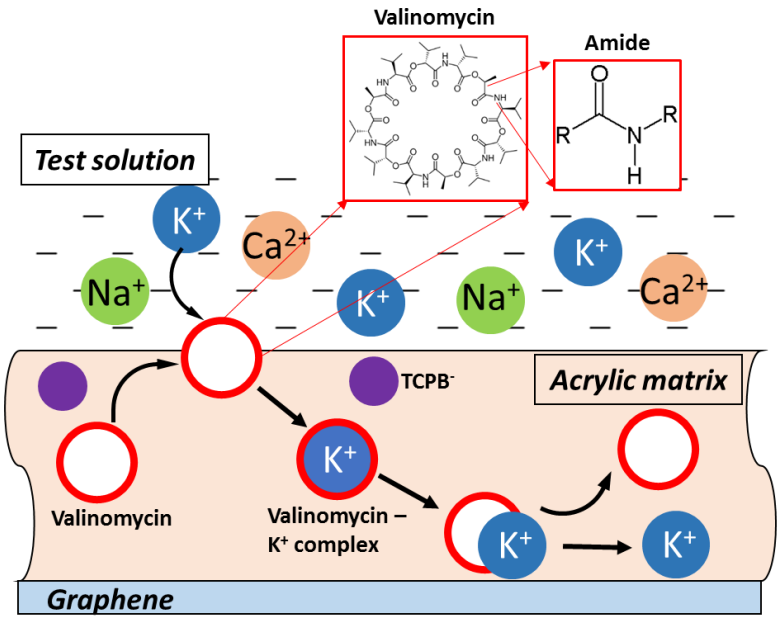

Fig. S4: Schematic illustration for K^+ ion diffuse through K^+ ion selective membrane.

Figure S5, Li *et al.*

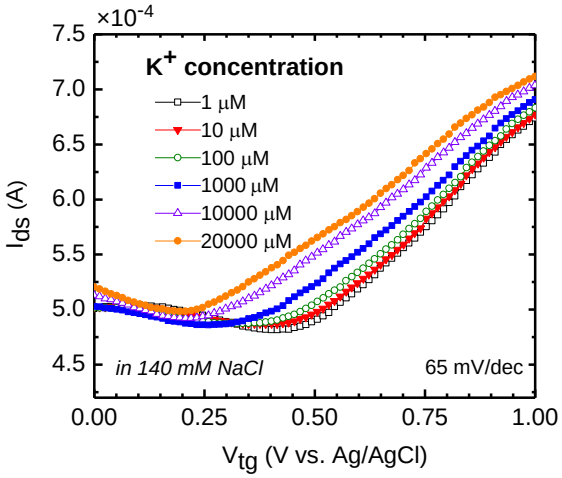

Fig. S5: K^+ sensing with very high (140 mM) Na^+ background concentration mimicking realistic physiological solutions showing very good sensitivity.

Figure S6, Li *et al.*

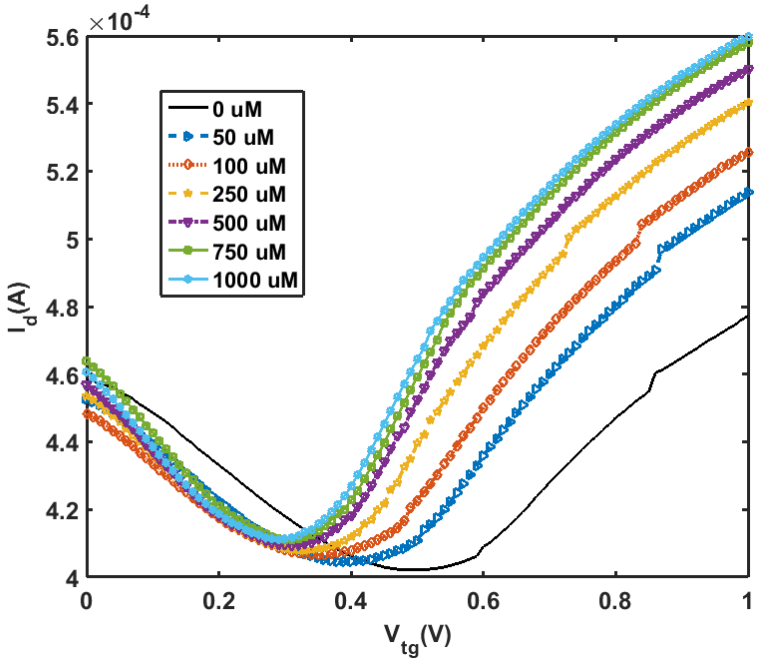

Fig. S6: K^+ ion response of Graphene-based ISFET without ion selective membrane coating.