Ion gel gated graphene transistors on plastic

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A high-performance low-voltage graphene field-effect transistor (FET) array was fabricated on a flexible polymer substrate using solution-processable, high-capacitance ion gel gate dielectrics. The high capacitance of the ion gel, which originated from the formation of an electric double layer under the application of a gate voltage, yielded a high on-current and low voltage operation below 3 V. The graphene FETs fabricated on the plastic substrates showed a hole and electron mobility of 203 ± 57 and 91 ± 50 cm^2/Vs, respectively, at a drain bias of −1 V. Moreover, ion gel gated graphene FETs on the plastic substrates exhibited remarkably good mechanical flexibility. This method represents a significant step in the application of graphene to flexible and stretchable electronics.