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Characterizations of Ion Gel Dielectrics for Flexible Nanoelectronic Devices KWANBYUNG CHAE, WOONGBIN YIM, VAN TU NGUYEN, JAEWOO PARK, JI-YONG PARK, Department of Physics and Department of Energy Systems Research, Ajou University — Electric double layer transistor (EDLT) utilizing ion liquid can be operated with small voltages with large carrier density controllability. However, ion liquid is generally incompatible with various processes or operating environments of nanoelectronic devices. Ion gels prepared by mixing a host polymer and ionic liquid are good candidates for device applications overcoming the aforementioned shortcomings of ion liquid. In this study, we investigated ion gels consisting of PVDF-HFP (Poly(vinylidene fluoride-co-hexafluoropropylene)) and [EMIM][TFSI] (1-Ethyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide) for device applications, especially for graphene field effect transistors (GFETs). Ion gels with different ratio of the host polymer and ionic liquid are prepared and their capacitance and conductance are measured to assess the optimal condition for device applications. The time response and stability of GFETs with ion gels are also investigated for possible flexible electronics applications.

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