

Supplementary Information

Cholinium Based Ion Gels as Solid Electrolytes for Long-Term Cutaneous Electrophysiology

Mehmet Isik^{1a}, Thomas Lonjaret^{1de}, Haritz Sardon^a, Rebeca Marcilla^b, Thierry Herve^e,
George G. Malliaras^d, Esma Ismailova^{*d} and David Mecerreyes^{*ac}

^a POLYMAT, University of the Basque Country UPV/EHU, Avda. Tolosa 72, 20018, San Sebastian, Spain. Fax: 34 943 506062; Tel: 34 943 018018; *E-mail: david.mecerreyes@ehu.es

^b Electrochemical Processes Unit, IMDEA Energy Institute, Avda. Ramón de la Sagra 3, Parque Tecnológico de Móstoles, 28935 Móstoles, Spain

^c IKERBASQUE, Basque Foundation for Science, E-48011, Bilbao, Spain

^d Department of Bioelectronics Centre Microélectronique de Provence Ecole Nationale Supérieure des Mines de Saint Etienne 880 route de Mimet, 13541 Gardanne, France; *E-mail: ismailova@emse.fr

^e Microvitae Technologies, Hôtel Technologique, Europarc Sainte Victoire Bât, Route de Valbrillant, 13590 MEYREUIL, France

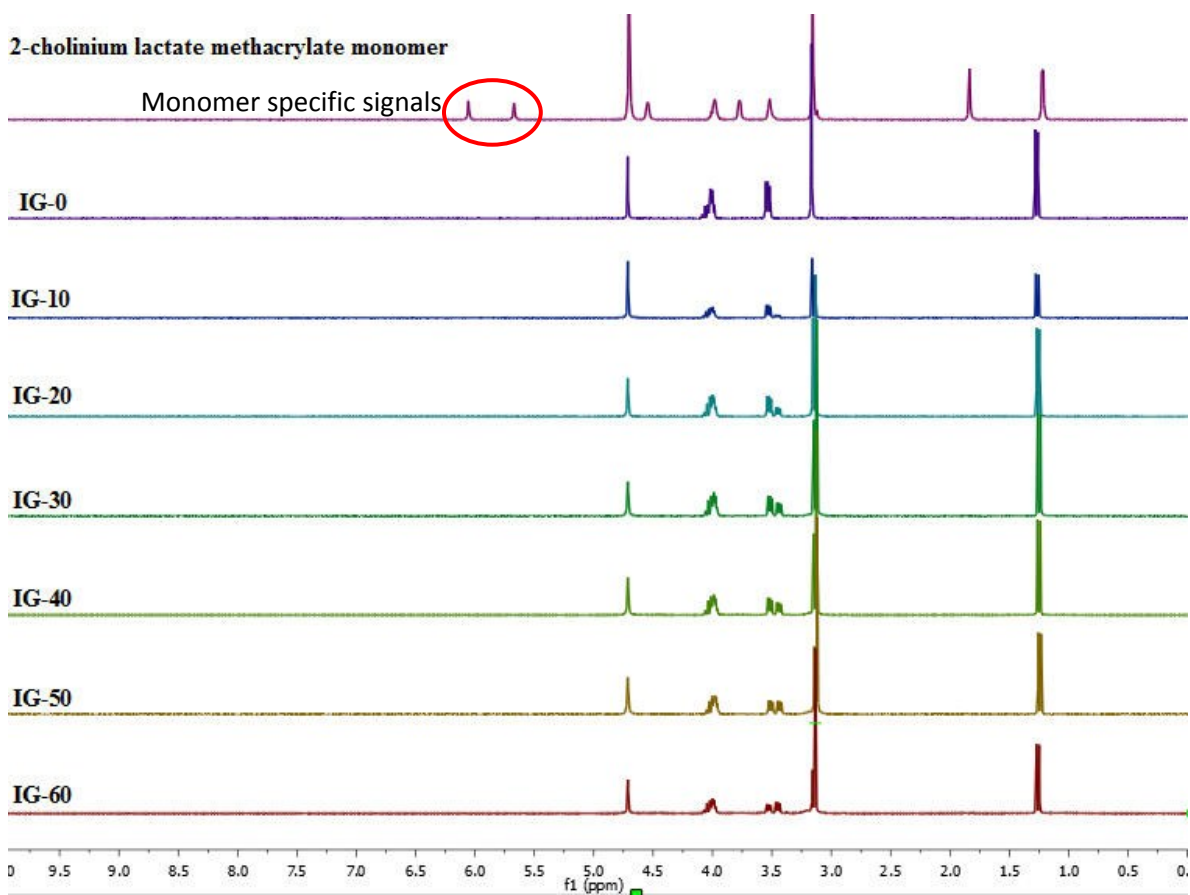


Fig. S1. ¹H NMR spectra of ion gels immersed into D₂O.

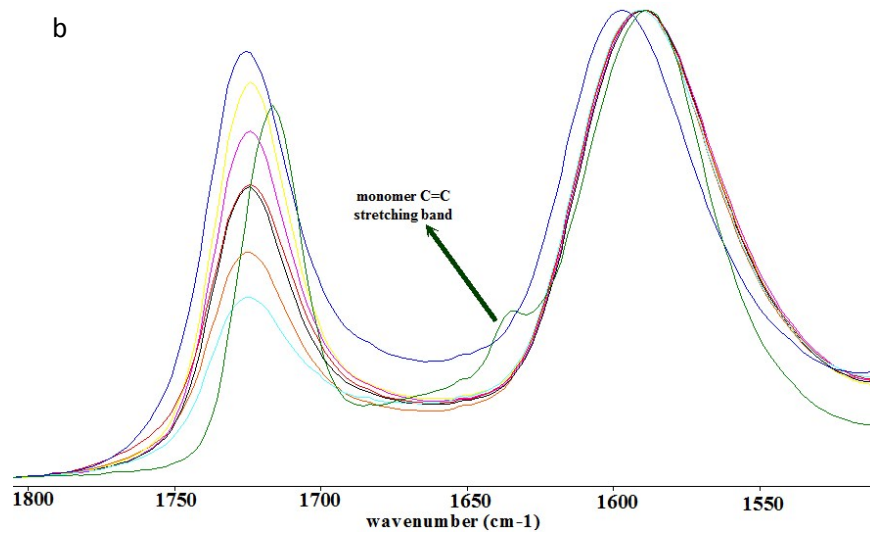
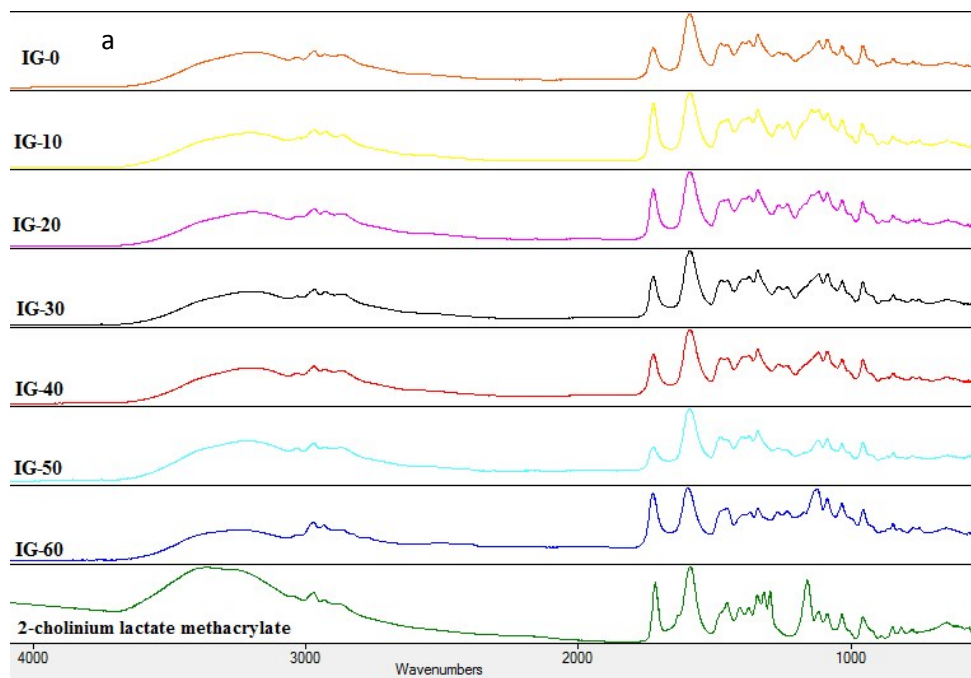


Fig. S2. ATR-FTIR spectra of the ion gels a) 500-4000 cm^{-1} b) 1500-1800 cm^{-1} .

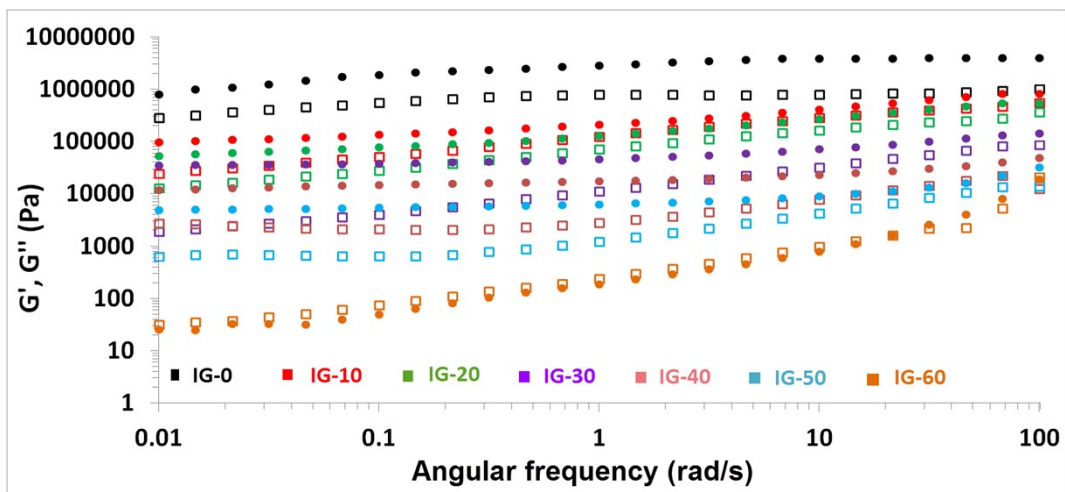


Fig. S3. Rheological properties of the ion gels from 0% up to 60% of free ionic liquid content.

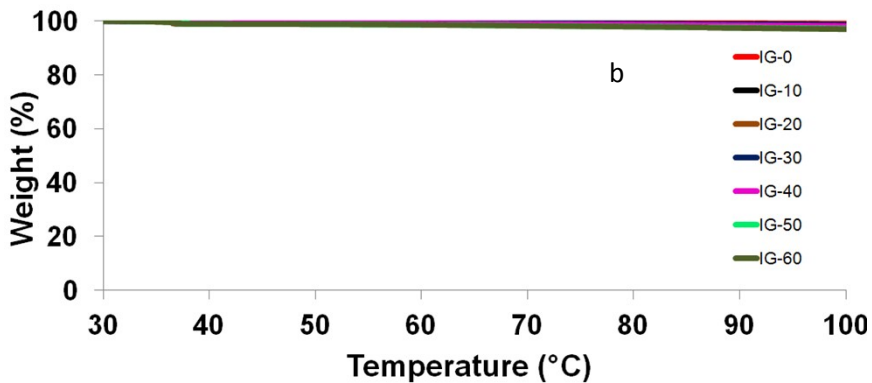
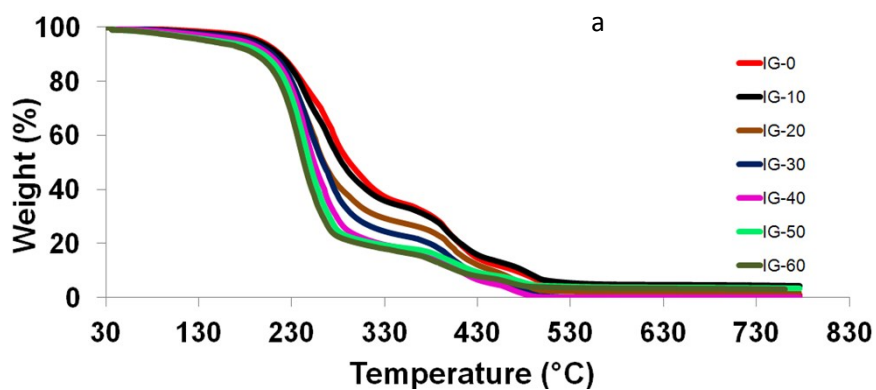


Fig. S4. The TGA curves of the ion gel a) 30^o-800^oC range and a) detailed view of 30^oC-100^oC region.

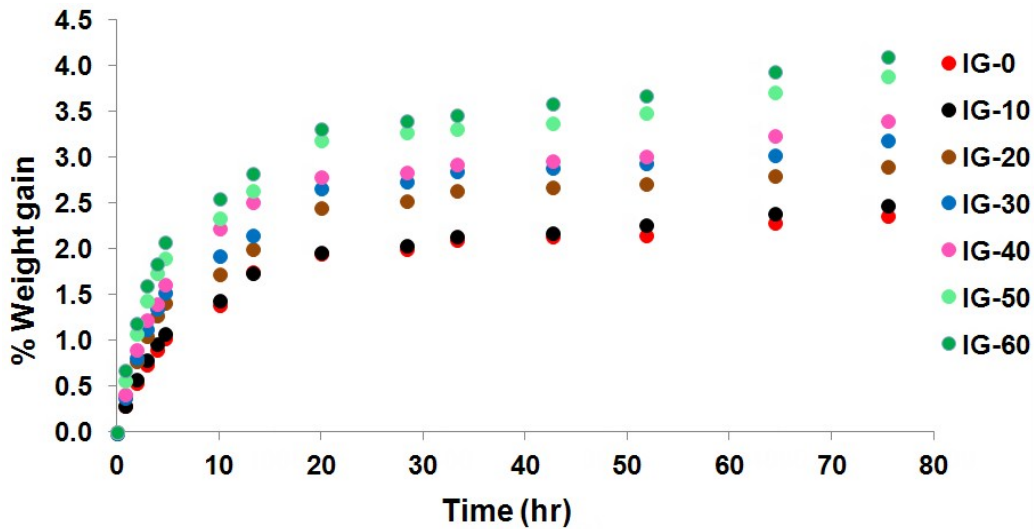


Fig.S5. The % weight gain of the ion gels when they are left at ambient humidity. The ion gels were exposed to environmental humidity seems to not affect the integrity of the ion gels. The ion gels were left at ambient temperature (24°C) having relative humidity values set between 60-70%. The water uptake was evaluated gravimetrically over 80hrs. We observe that the water uptake was more important for the ion gels containing higher amount of free ionic liquid. The highest % weight gain being around 4.

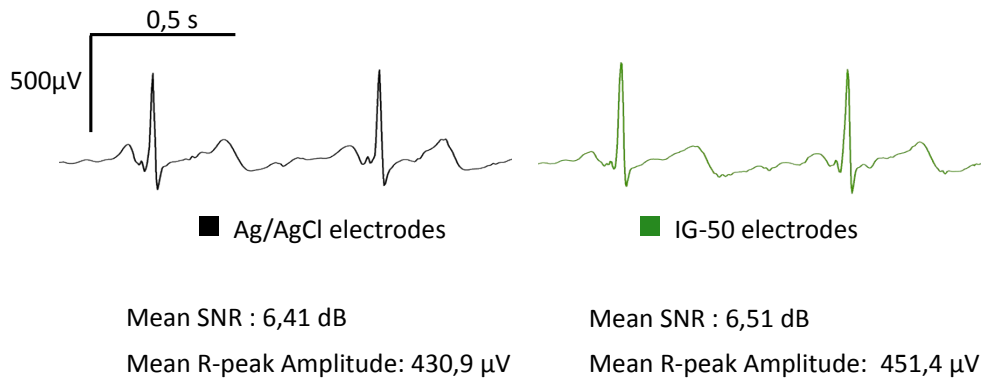


Fig.S6. Comparison of ECG recording performance: Ag/AgCl medical standard (in Black) vs cholinium ion gel IG-50-assisted (in Green) electrodes. ECG signals were recorded on skin afterward 3h of contact. SNR and R-peaks amplitudes evolutions were obtained following the same protocol as for Figure 7.