

Electrodeposition of germanium at elevated temperatures and pressures from ionic liquids

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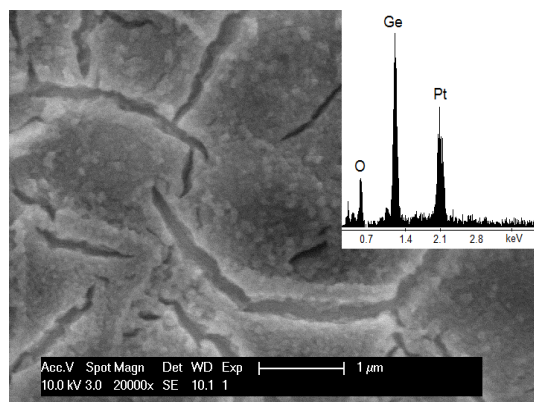


Figure S1: SEM image and EDX spectrum of the germanium film electrodeposited at -1.6 V from 0.4 M $[\text{GeCl}_4(\text{BuIm})_2]$ in $[\text{BMP}][\text{DCA}]$ at 120 °C. The working electrode was a platinum wafer, the counter electrode was a *p*-type wafer and the reference electrode was a platinum wire. The solution was stirred with a magnetic stirrer bar during electrodeposition.

Table S1: Viscosity of $[\text{BMP}][\text{Tf}_2\text{N}]$ at different temperatures

Temperature (°C)	Kinematic viscosity ($10^{-6} \text{ m}^2 \text{ s}^{-1}$)	Dynamic viscosity (10^{-3} Pa s)
21	49.9	69.7
50	19.1	26.3
70	11.0	14.9
80	8.8	11.8
100	5.9	7.8
120	4.3	5.6
150	2.9	3.8

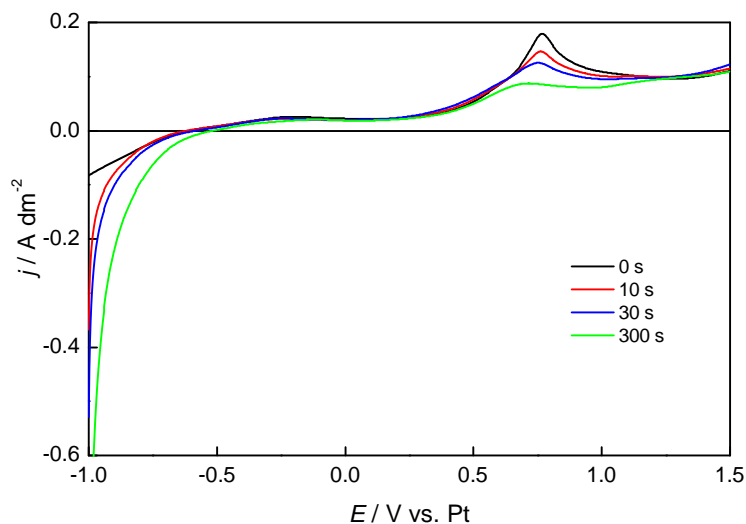


Figure S2: Linear scan voltammograms of $[\text{BMP}][\text{Tf}_2\text{N}]$ solution containing 0.5 M GeCl_4 at room temperature. The working electrode was a platinum disk ($\phi = 1 \text{ mm}$) which was polarized at -1.0 V with the charge of -2 C dm^{-2} and then kept at open circuit potential for different times of 0 s, 10 s, 30 s and 600 s before performing LSV. The counter electrode was a platinum coil.

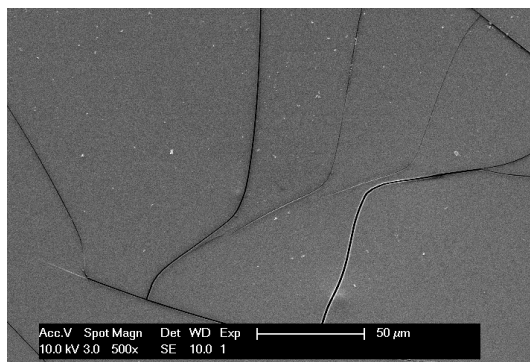


Figure S3: SEM image of the germanium film electrodeposited at -0.9 V at 150 °C for one hour. The counter electrode was a *p*-type germanium wafer. The solution was stirred by a magnetic stirrer bar.



Figure S4: Photograph of the germanium film electrodeposited at -0.9 V at 180 °C for one hour. The counter electrode was a *p*-type germanium wafer. The solution was stirred by a magnetic stirrer bar.