High concentration DNA solubility in bio-ionic liquids with long-lasting chemical and structural stability at room temperature

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Figure S1: 1H NMR spectra of Cho-glycolate ; 1H NMR (D2O, 200 MHz, δ/ppm relative to TMS): 3.2 (s, 9H, -N-CH3), 3.51 (t, 2H, -CH2-N-), 3.66 (s, 2H, -OH), 3.94 (t, 2H, -O-CH2-), 4.05 (t, 2H, -CO-CH2-O-).

Figure S2: 1H NMR spectra of Choline pyruvate ; 1H NMR (D2O, 200 MHz, δ/ppm relative to TMS): 2.33 (s, 3H, -CH3), 3.17 (s, 9H, -N-CH3), 3.48 (t, 2H, -CH2-N-), 3.62 (s, 1H, -OH), 4.01 (t, 2H, -O-CH2-).
Figure S3: ESI-MS spectra of Choline glycolate in ES (+)ve mode.

Calculated m/z: 104.11 (100.0%)

Figure S4: ESI-MS spectra of Choline glycolate in ES (-)ve mode.

Calculated m/z: 75.01 (100.0%)
Figure S5: ESI-MS spectra of Choline pyruvate in ES (+)ve mode.

Calculated m/z: 104.11 (100.0%)

Figure S6: ESI-MS spectra of Choline pyruvate in ES (-)ve mode.

Calculated m/z: 87.01 (100.0%)
### Table S1: The physiochemical parameters of bio-ILs used in this study

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Cho-Gly</th>
<th>Cho-Pyr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity (mPa.s) at 25 °C</td>
<td>93.7</td>
<td>204.7</td>
</tr>
<tr>
<td>Density (gm.cm(^{-3}))</td>
<td>1.204</td>
<td>1.186</td>
</tr>
<tr>
<td>(T_g) (°C)</td>
<td>-98.4</td>
<td>-98.8</td>
</tr>
<tr>
<td>(T_m) (°C)</td>
<td>16.0</td>
<td>16.6</td>
</tr>
<tr>
<td>(T_{dec}) (°C)</td>
<td>256</td>
<td>230</td>
</tr>
<tr>
<td>Moisture contents (wt %)</td>
<td>1.65</td>
<td>1.81</td>
</tr>
</tbody>
</table>

Note: \(T_g\) = Glass transition temperature; \(T_m\) = Melting temperature; \(T_{dec}\) = Decomposition temperature.

### Figure S7: Digital photographs of Cho-Gly after dissolution of DNA in different concentrations (A) 2 wt %, (B) 4 wt %, (C) 6 wt %, (D) 8 wt %, and (E) 10 wt %.

### Figure S8: Optical images of Cho-Pyr (A) and Cho-Pyr after dissolution of 2 wt % DNA (B).
Figure S9: Phase contrast optical micrograph of (A) DNA in Cho-Gly (at 0 minute) (B) 8 % w/w DNA in Cho-Gly after complete dissolution (C) 10 % w/w DNA in Cho-Gly (after 48 h), (D) DNA in Cho-Pyr (at 0 minute), (E) 2 % w/w DNA in Cho-Pyr after complete dissolution, and (F) 4 % DNA in Cho-Pyr (after 48 h).

Figure S10: $^1$H NMR spectra of recovered Choline glycolate
**Figure S10:** $^1$H NMR spectra of recovered Choline pyruvate

**Figure S11:** FT-IR spectra of regenerated DNA from Cho-Pyr.
**Figure S12:** FT-IR spectra of DNA in Cho-Gly solution.

**Figure S13:** $^{31}$P NMR spectra of DNA in Cho-Gly using ortho-phosphoric acid as internal standard.
Figure S14: UV-Vis spectra of regenerated DNA ($6.0 \times 10^{-5}$ mol.L$^{-1}$) from Cho-Pyr.

Figure S15: CD spectra of regenerated DNA ($6.0 \times 10^{-5}$ mol.L$^{-1}$) from Cho-Pyr.
Figure S16: Isothermal titration calorimetric (ITC) plot for titration of 600 μL of 5.0 x 10⁻⁵ mol.L⁻¹ DNA solution in tris-HCl buffer with successive addition of 2 μL of 0.1 mol.L⁻¹ Cho-Pyr solutions at 298.15 K.
Figure S17: Agarose gel electrophoresis of standard salmon testes DNA (A) and regenerated DNA from Cho-Gly (B) and Cho-Pyr (C).

1 = Marker, 2 : standard DNA ; 3 : DNA recovered from Cho-Gly and 4 : DNA recovered from Cho-Pyr

Fig. S18: The PCR amplification of the standard and regenerated Ulva genomic DNA