**Vapor composition and vaporization thermodynamics of   
1‐ethyl‐3‐methylimidazolium hexafluorophosphate ionic liquid**

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**Supplementary materials**

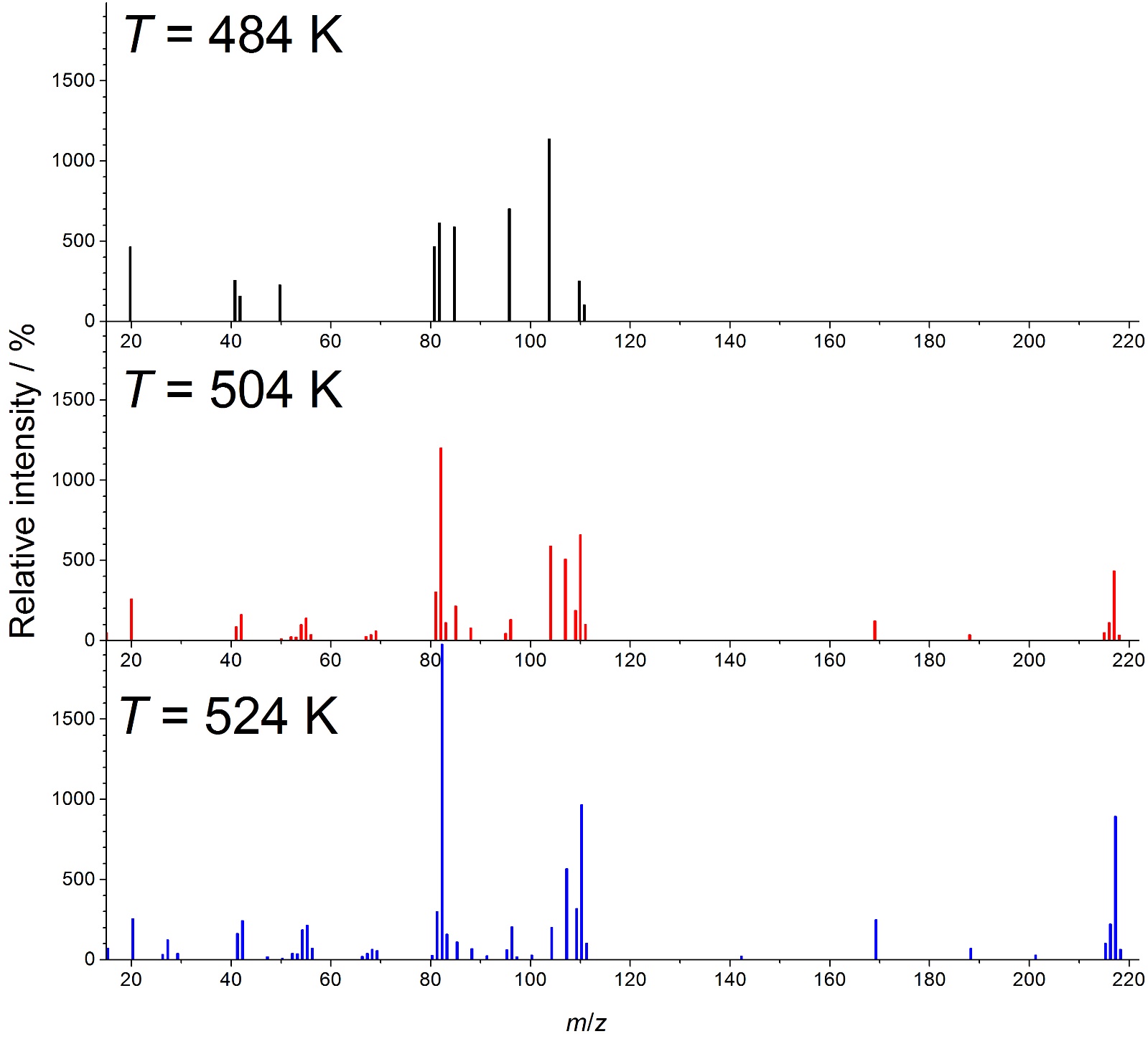


Fig. S1. Full-scale background subtracted electron ionization mass spectra of EMImPF6 under EC-I conditions relative to the intensity of the parent cation (*m*/*z* = 111)

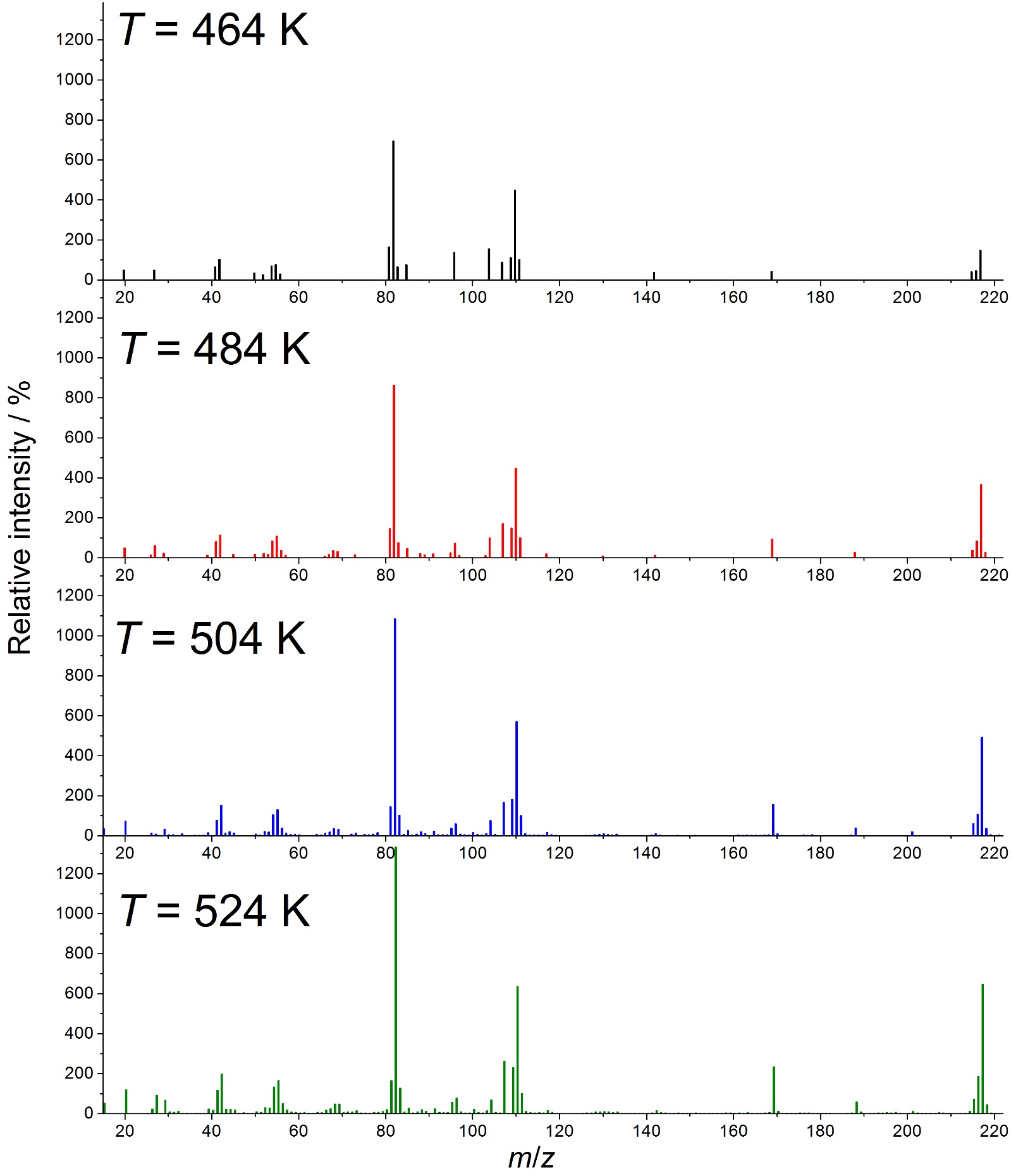


Fig. S2. Full-scale background subtracted electron ionization mass spectra of EMImPF6 under EC-II conditions relative to the intensity of the parent cation (*m*/*z* = 111)

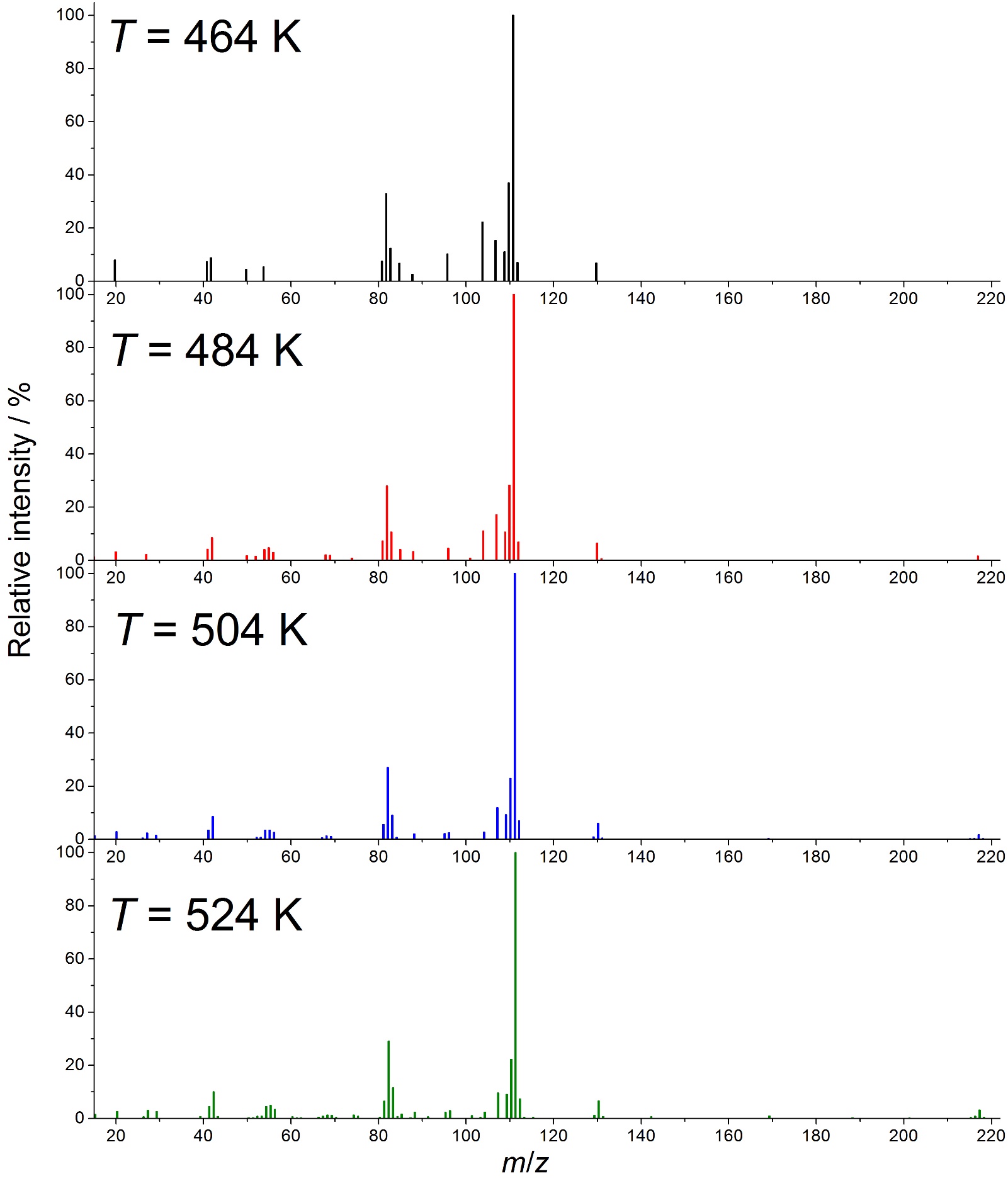


Fig. S3. Full-scale background subtracted electron ionization mass spectra of EMImPF6 under OC conditions relative to the intensity of the parent cation (*m*/*z* = 111)

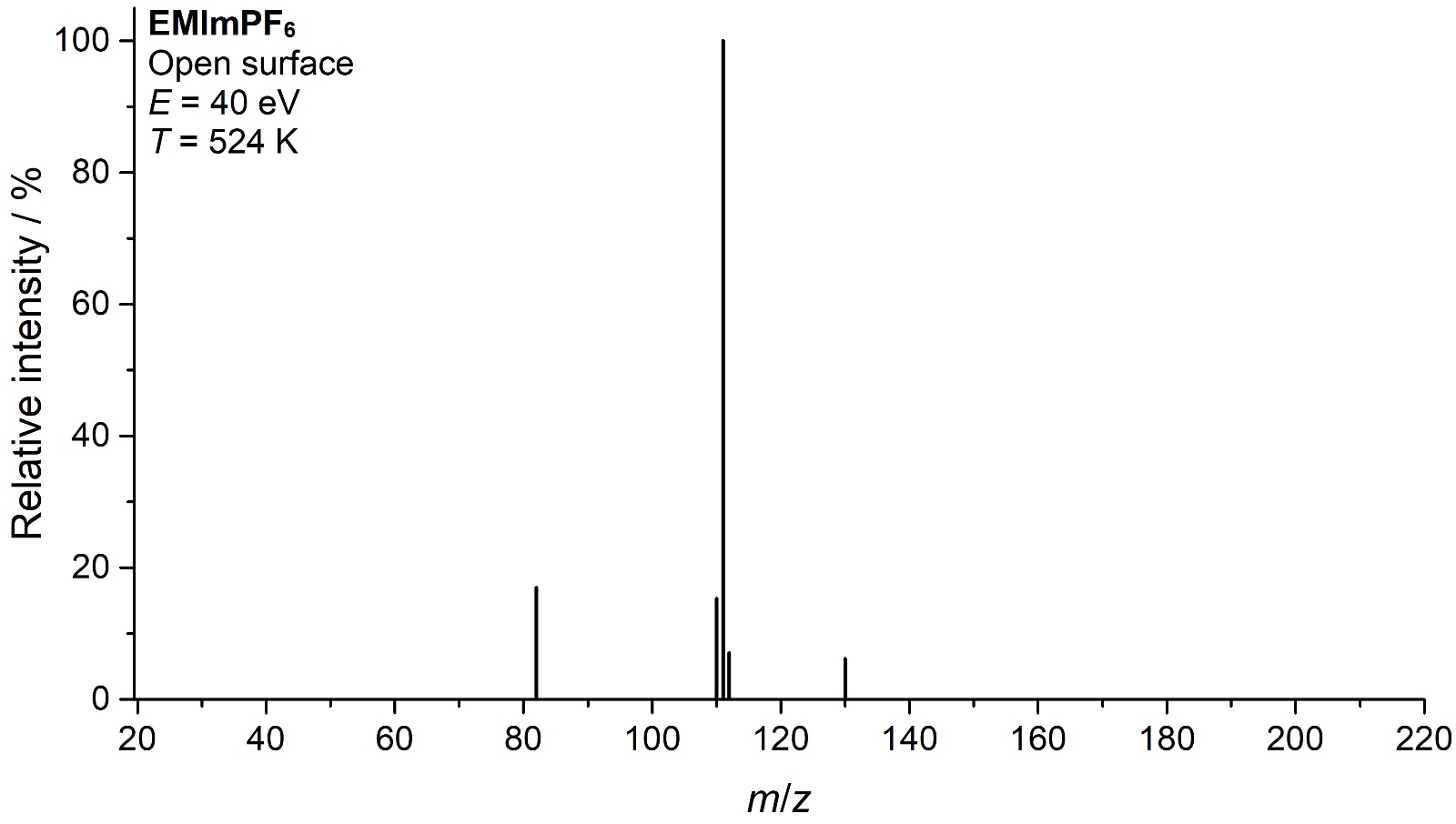


Fig. S4. Full-scale background subtracted electron ionization mass spectra of EMImPF6 under OS conditions relative to the intensity of the parent cation (*m*/*z* = 111)

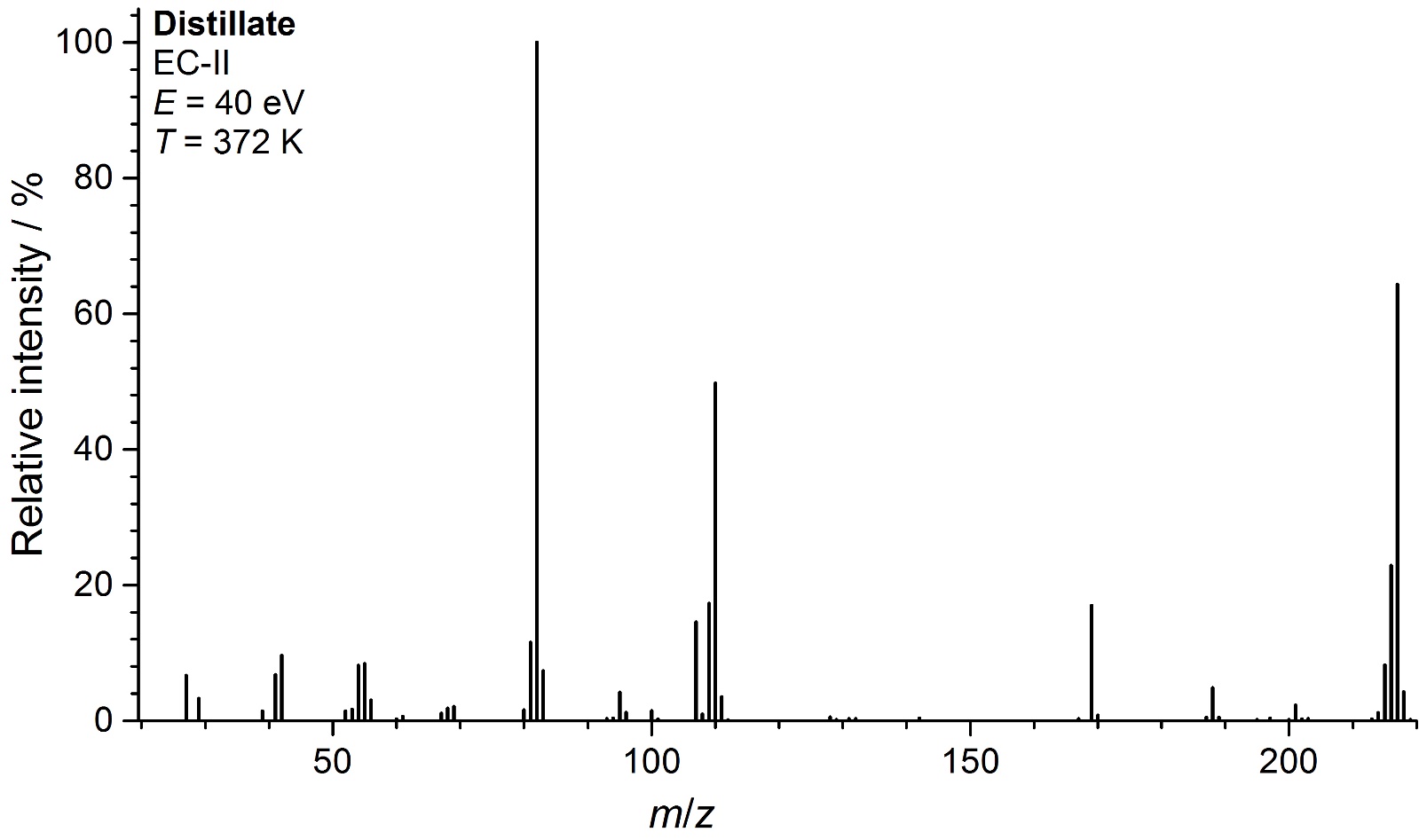


Fig. S5. Full-scale background subtracted electron ionization mass spectra of IL distillate under EC-II conditions relative to the intensity of an ion with *m*/*z* = 82

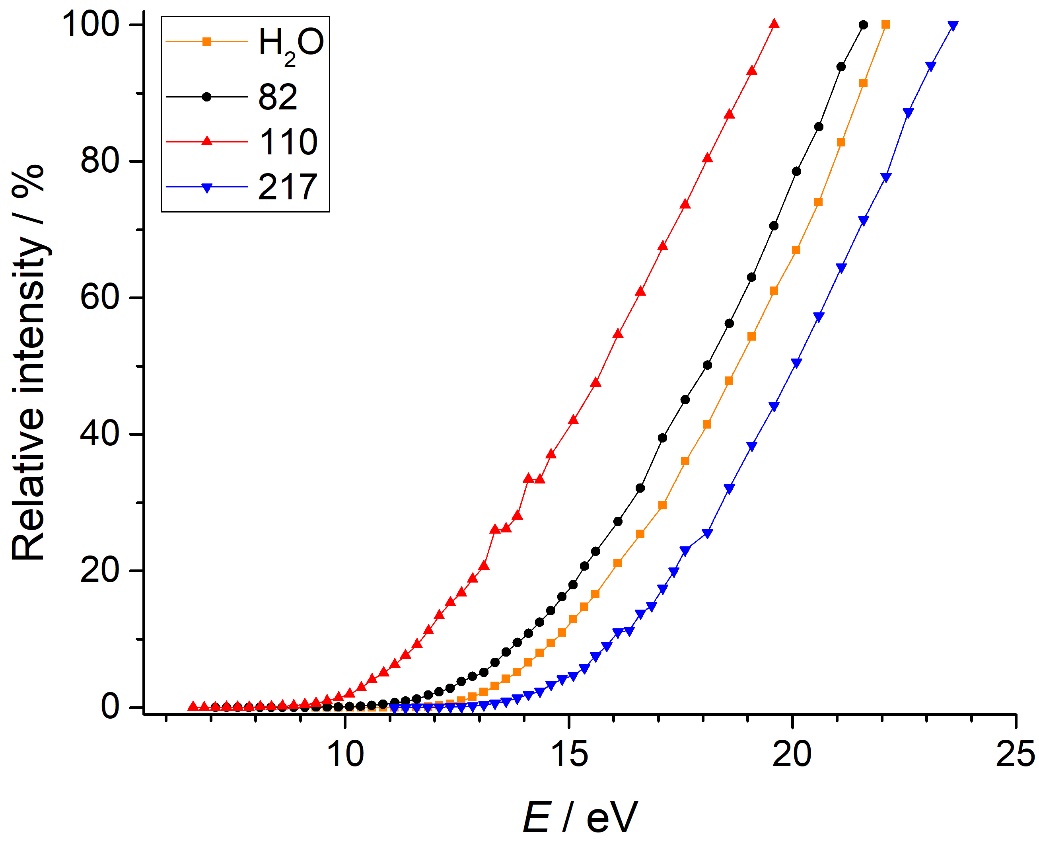


Fig. S6. Ionization efficiency curves of the ions of IL distillate (90% is C6N2H10PF5) under EC-II conditions at 374 K

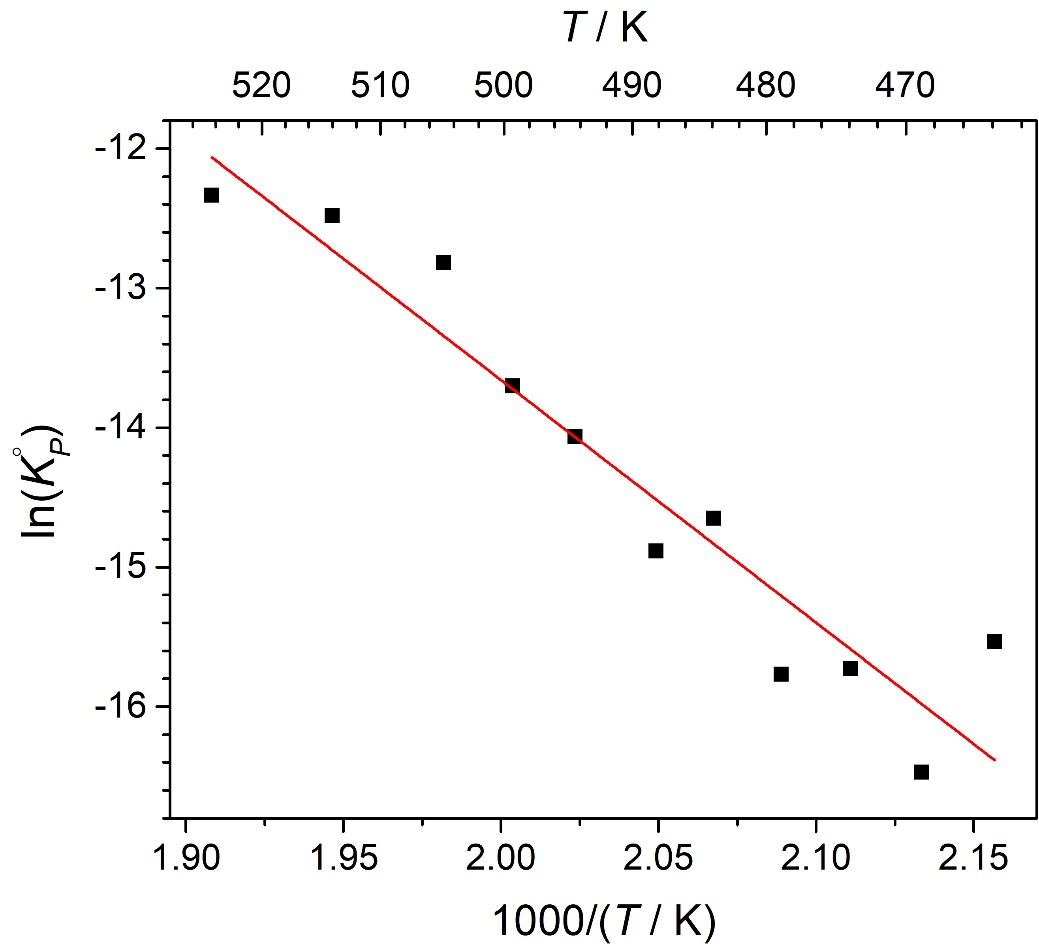


Fig. S7. Temperature dependence of equilibrium constant of reaction I

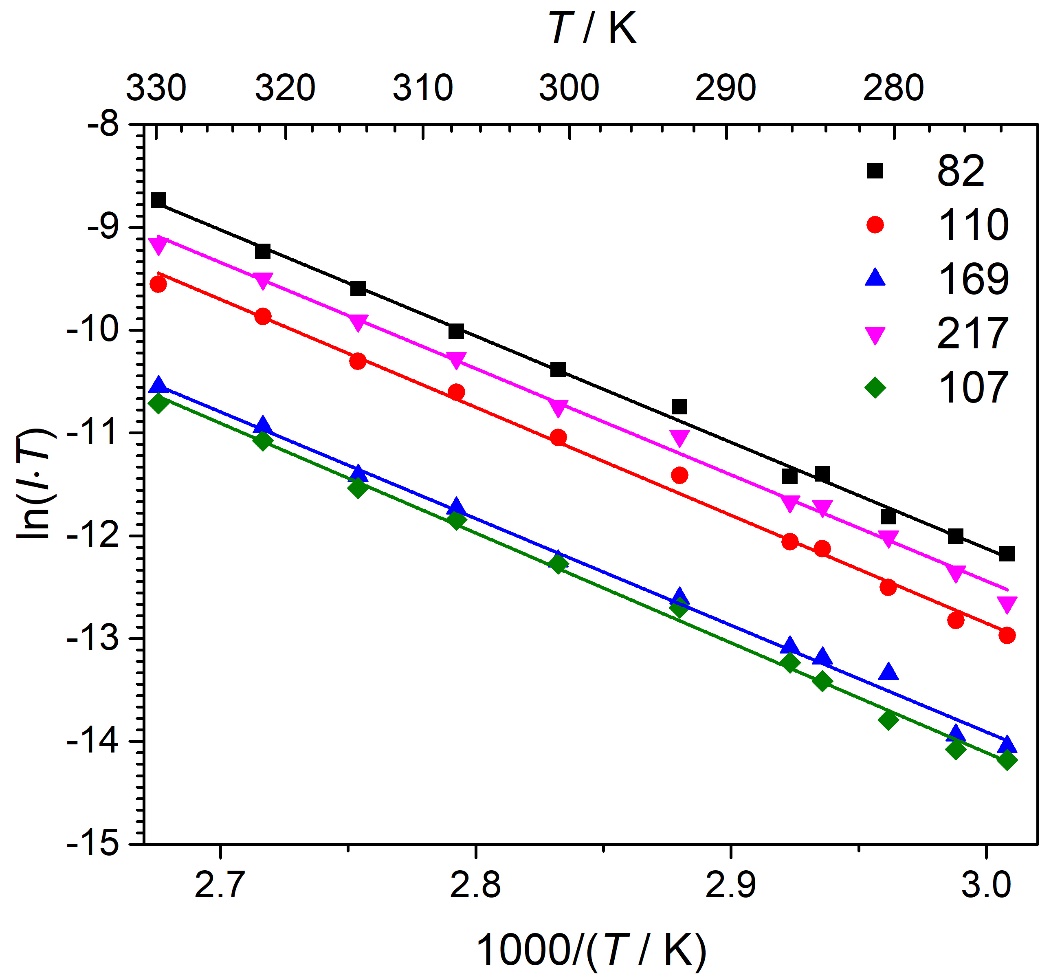


Fig. S8. Temperature dependencies of ion currents over IL distillate (90% is C6N2H10PF5) obtained under EC-II conditions

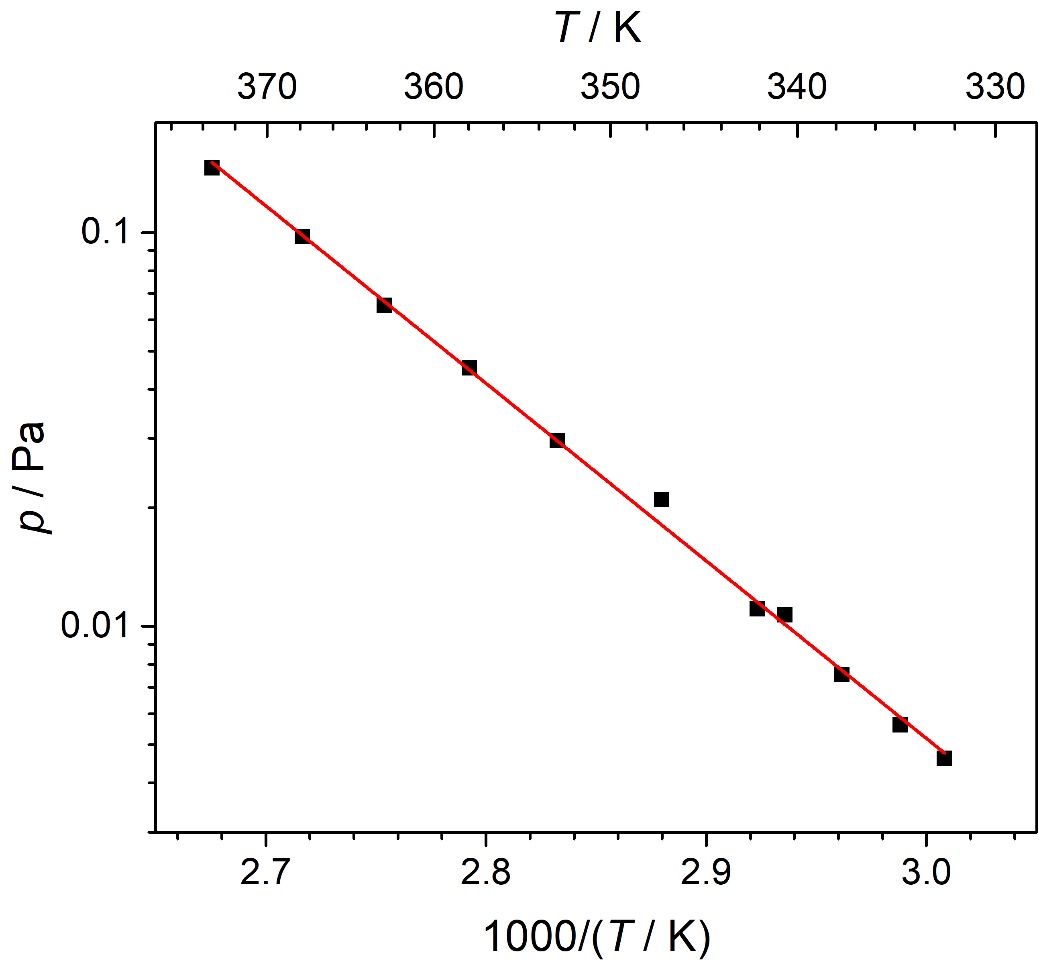


Fig. S9. Temperature dependence of C6N2H10PF5 vapor pressure over IL distillate (90% is C6N2H10PF5) under EC-II conditions

Table S1. List of isogyric reactions used for determination of  
 Δf*H°*(EMImPF6, g, 298.15 K)

|  |  |  |
| --- | --- | --- |
| Reaction | Δr*H°* / kJ·mol–1 | Δf*H°* / kJ·mol–1 |
| EMImPF6=EMIm++PF6– | 343.6 | -1933.4 |
| EMImPF6+H2+H–=Im+CH4+C2H6+PF6– | -494.7 | -1934.1 |
| EMImPF6+H–=Im+CH3·+C2H5·+ PF6– | -73.6 | -1943.2 |
| EMImPF6+HF=Im+CH3F+C2H5F+PF5 | 241.7 | -1938.8 |
| EMImPF6+H2=Im+CH4+C2H5F+PF5 | 131.6 | -1929.6 |
| EMImPF6+H2=Im+CH3F+C2H5F+PF3+HF | 329.1 | -1937.9 |
| EMImPF6+H2+H–=Pyr+CH4+C2H6+PF6– | -448.7 | 1935.5 |
| EMImPF6+H–=MIm+C2H6+PF6– | -465.2 | -1932.0 |
| EMImPF6+H=MIm+C2H6+PF5+F | 210.2 | -1936.3 |
| EMImPF6+H=MIm+C2H5·+HF+PF5 | 60.8 | -1948.6 |
| EMImPF6=MIm+C2H4+HF+PF5 | 211.0 | -1935.4 |
| EMImPF6=MIm+C2H5F+PF5 | 161.0 | -1927.5 |
| EMImPF6+H–=EIm+CH4+ PF6– | -475.4 | -1933.9 |
| EMImPF6+H=EIm+CH4+PF5+F | 200.1 | -1938.3 |
| EMImPF6+H=EIm+CH3·+HF+PF5 | 66.6 | -1936.6 |
| EMImPF6=EIm+CH3F+PF5 | 176.8 | -1948.8 |
| EMImPF6=EMIm+HF+PF5 | 100.7 | -1941.5 |
|  | **AVERAGE:** | -1937±3 |

Table S2. Calculated partial vapor pressures under EC conditions and sublimation enthalpies obtained in the framework of the third law method

|  |  |  |
| --- | --- | --- |
| *T* / K | *p* / ×104 Pa | Δs*H*o(NIP, 298.15 K) |
| 524 | 16.0 | 152.5 |
| 514 | 10.3 | 152.0 |
| 505 | 6.60 | 151.7 |
| 494 | 3.51 | 151.8 |
| 484 | 1.73 | 152.1 |
| 474 | 0.93 | 152.1 |
| 464 | 0.37 | 153.0 |
| 469 | 0.63 | 152.3 |
| 479 | 1.30 | 152.0 |
| 488 | 2.51 | 151.7 |
| 499 | 4.44 | 152.1 |
| 478 | 4.54 | 134.91 |
| 463 | 1.55 | 135.33 |

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