

Figure S1. Optimized structure of N-acetylglucosamine-N-acetylsalicylic acid β -1,4 Glucoside (β -1,4 Glucoside)

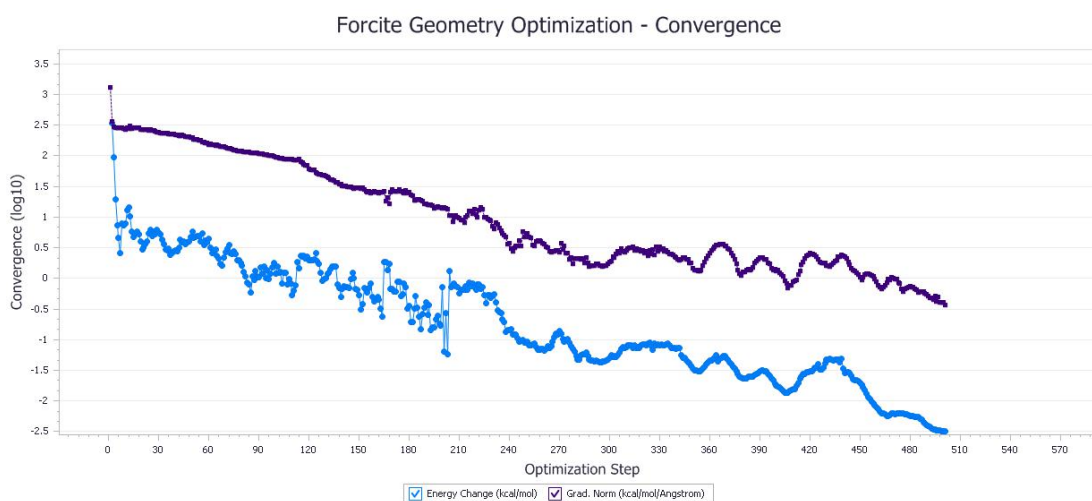
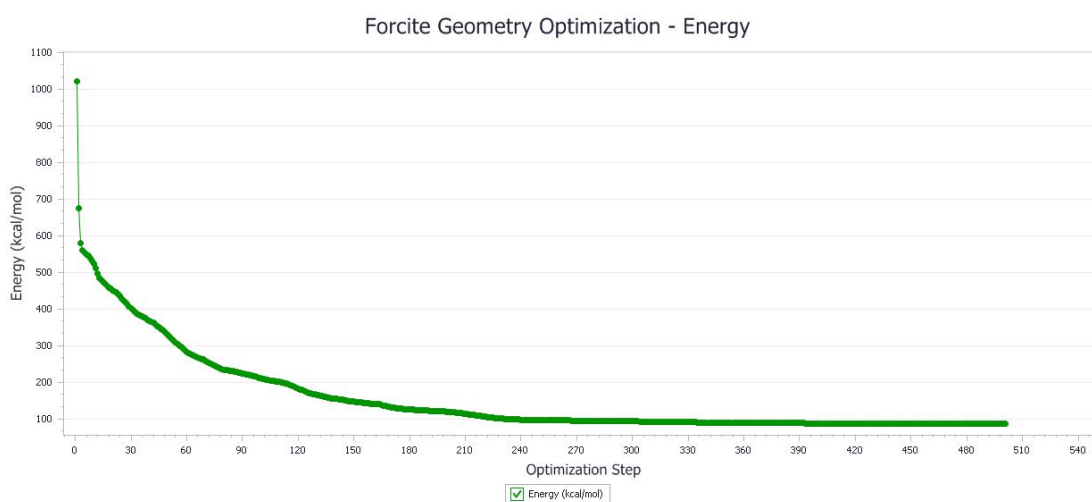


Figure S2. the energy and convergence of β -1,4 Glucoside

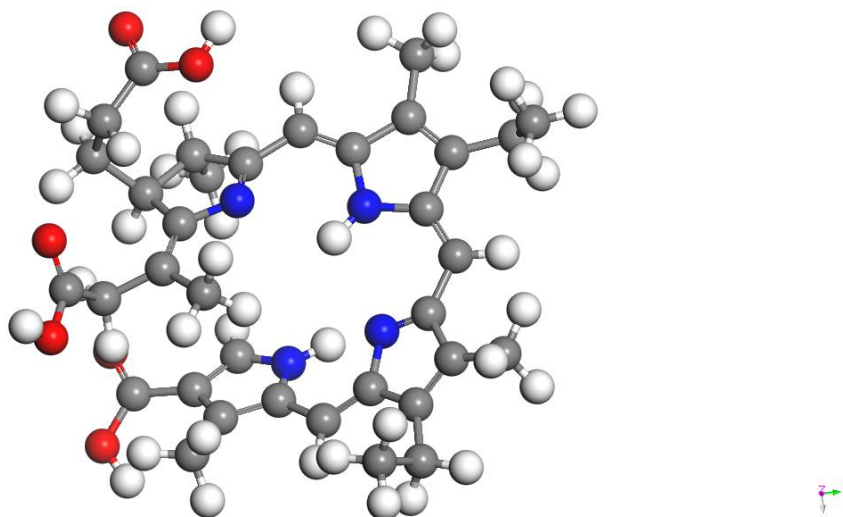
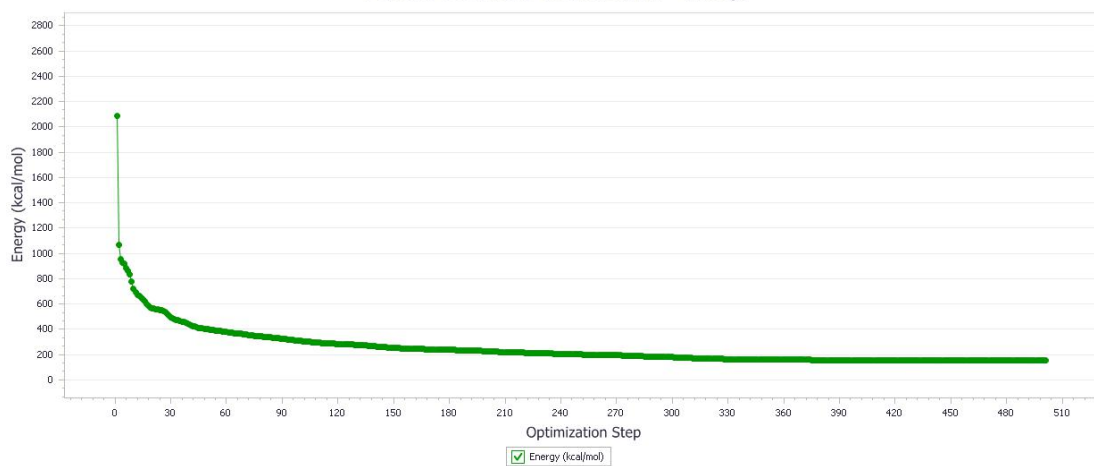


Figure S3. Optimized structure of Ce6

Forcite Geometry Optimization - Energy



Forcite Geometry Optimization - Convergence

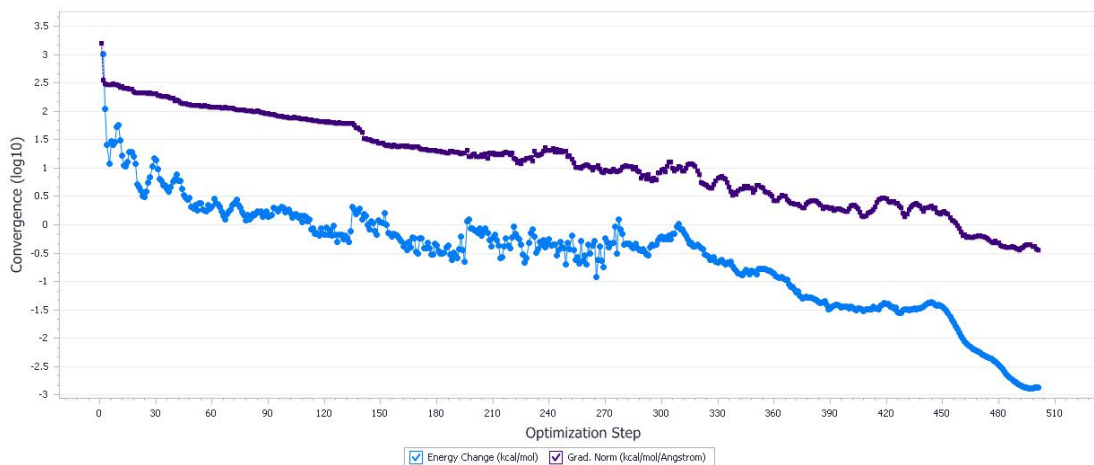


Figure S4. the energy and convergence of Ce6

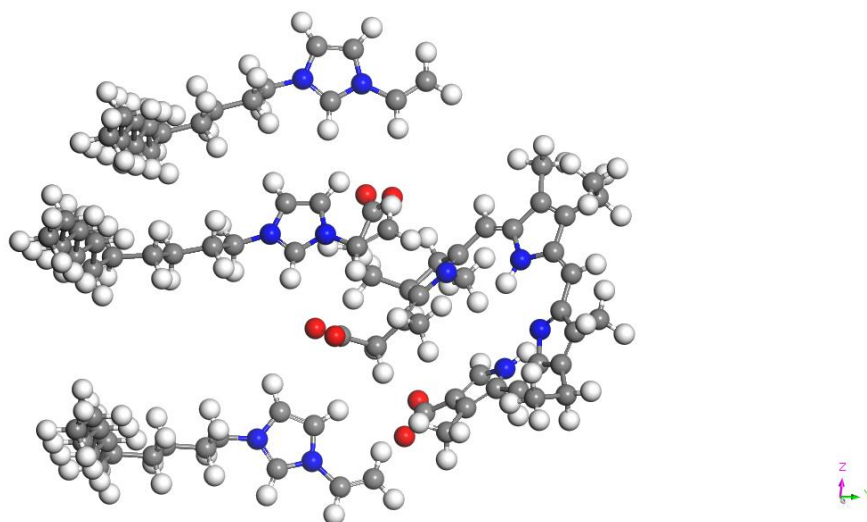
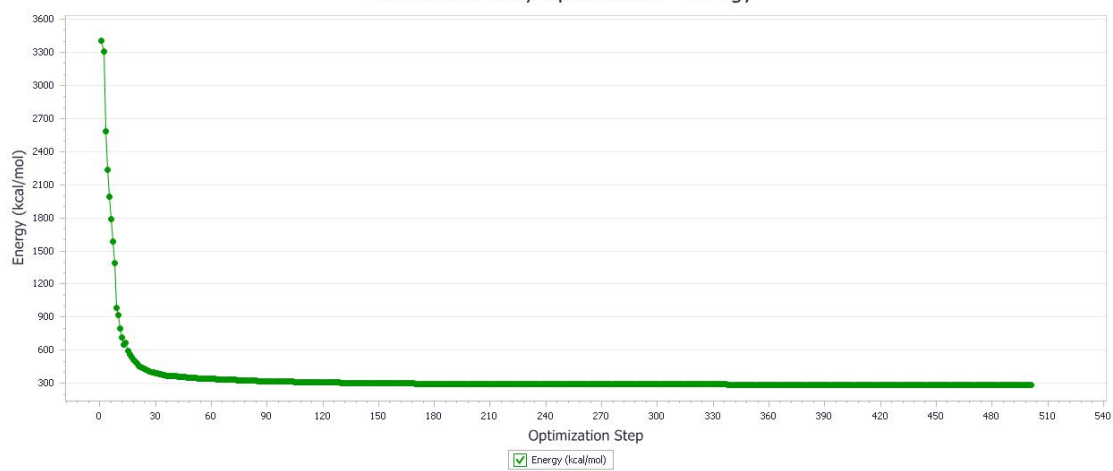


Figure S5. Optimized structure of Ce6-IL

Forcite Geometry Optimization - Energy



Forcite Geometry Optimization - Convergence

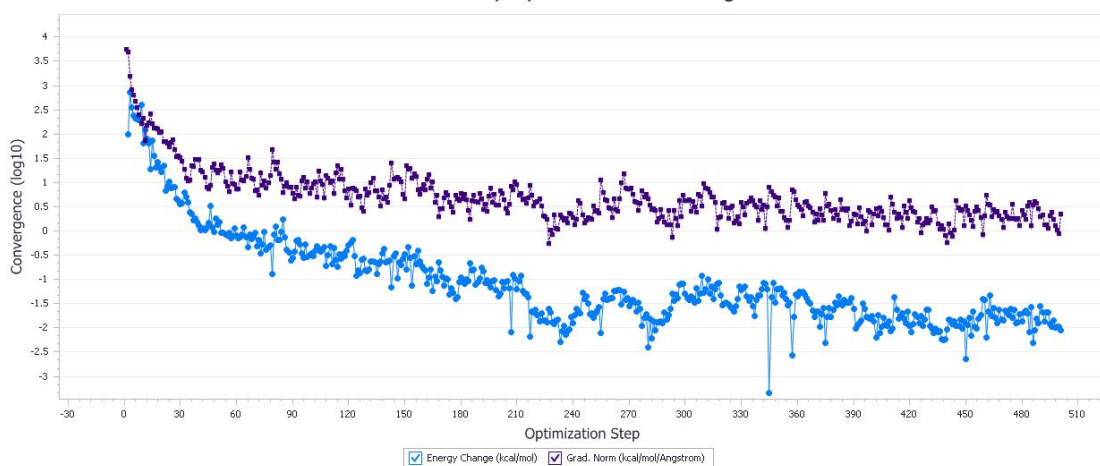


Figure S6. the energy and convergence of Ce6-IL

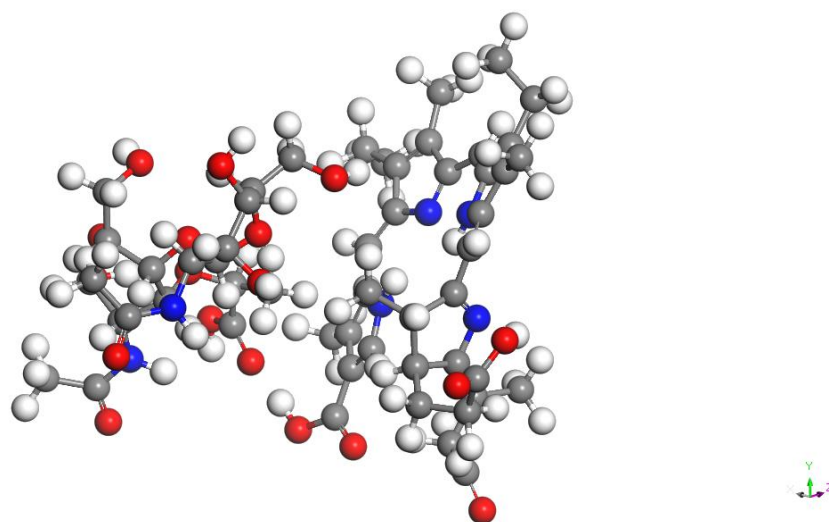


Figure S7. Optimized structure of Ce6 with β -1,4 Glucoside

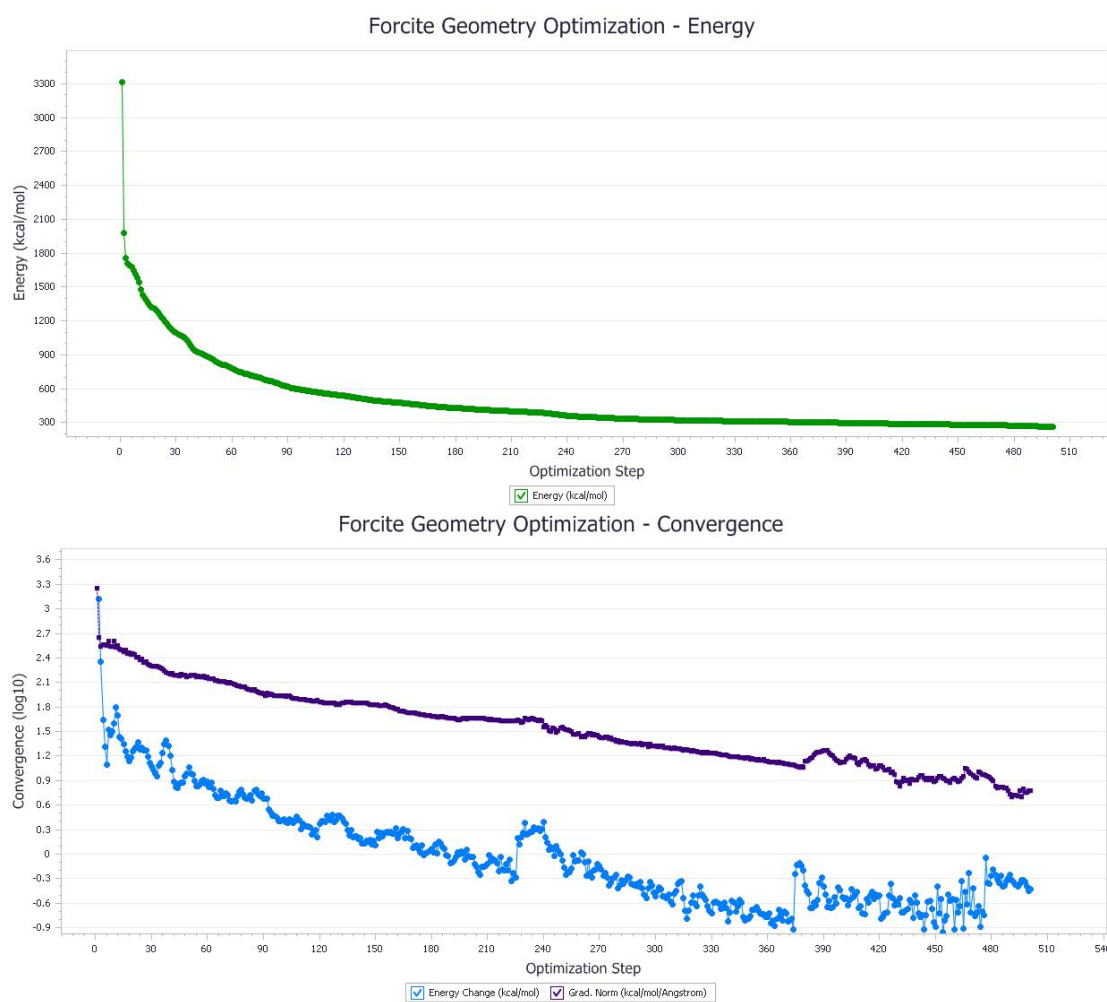


Figure S8. The energy and convergence of Ce6-ILwith β -1,4 Glucoside

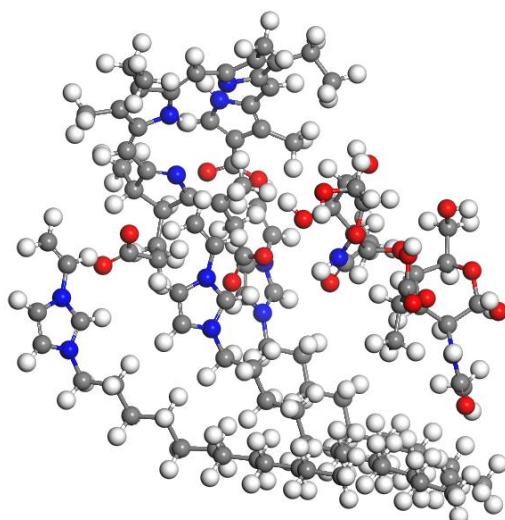


Figure S9. Optimized structure of Ce6-IL with β -1,4 Glucoside

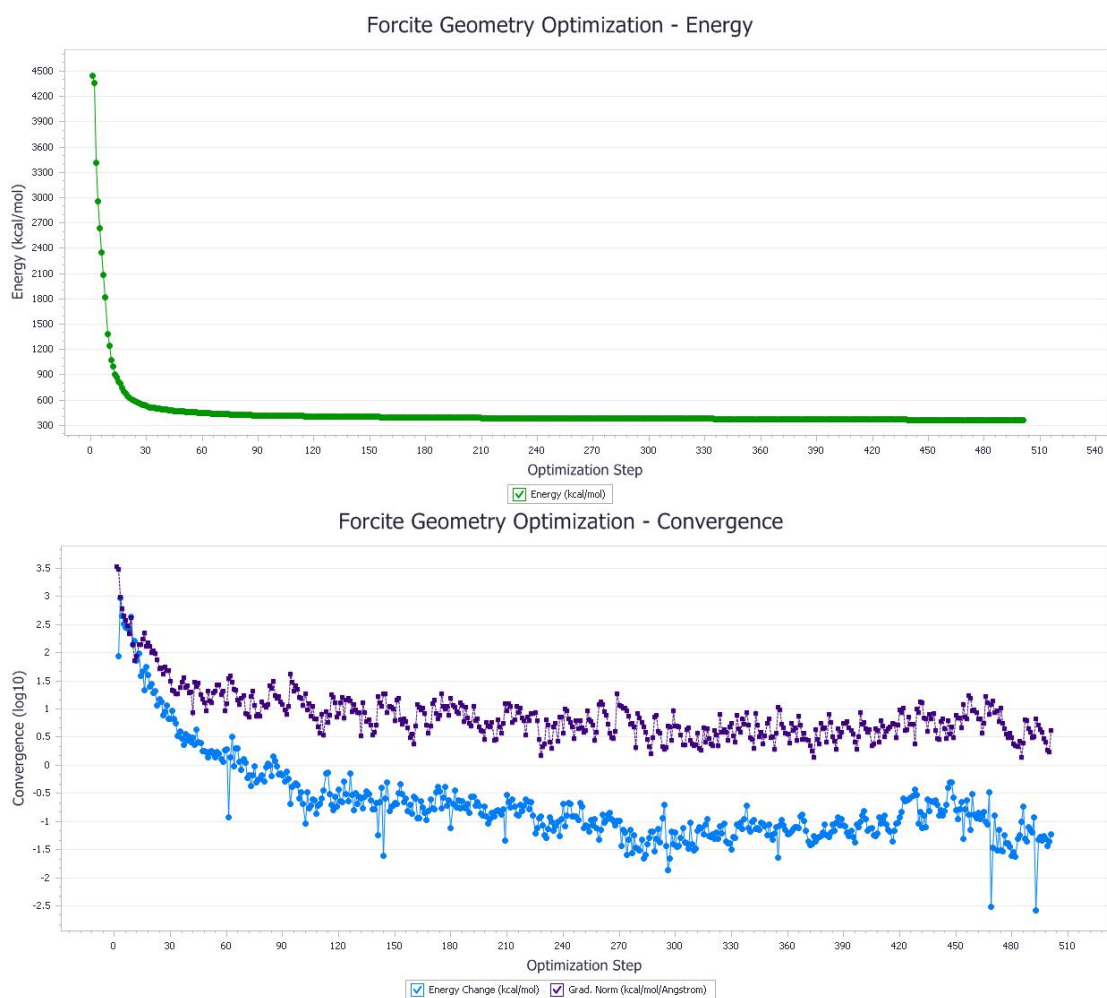


Figure S10. The energy and convergence of Ce6-IL with β -1,4 Glucoside

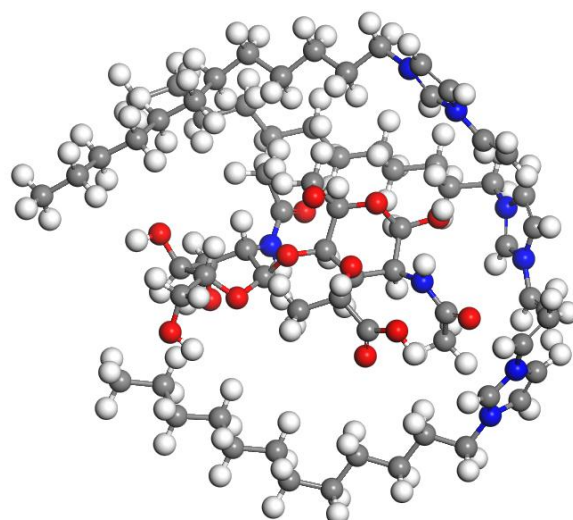


Figure S11. Optimized structure of IL and β -1,4 Glucoside

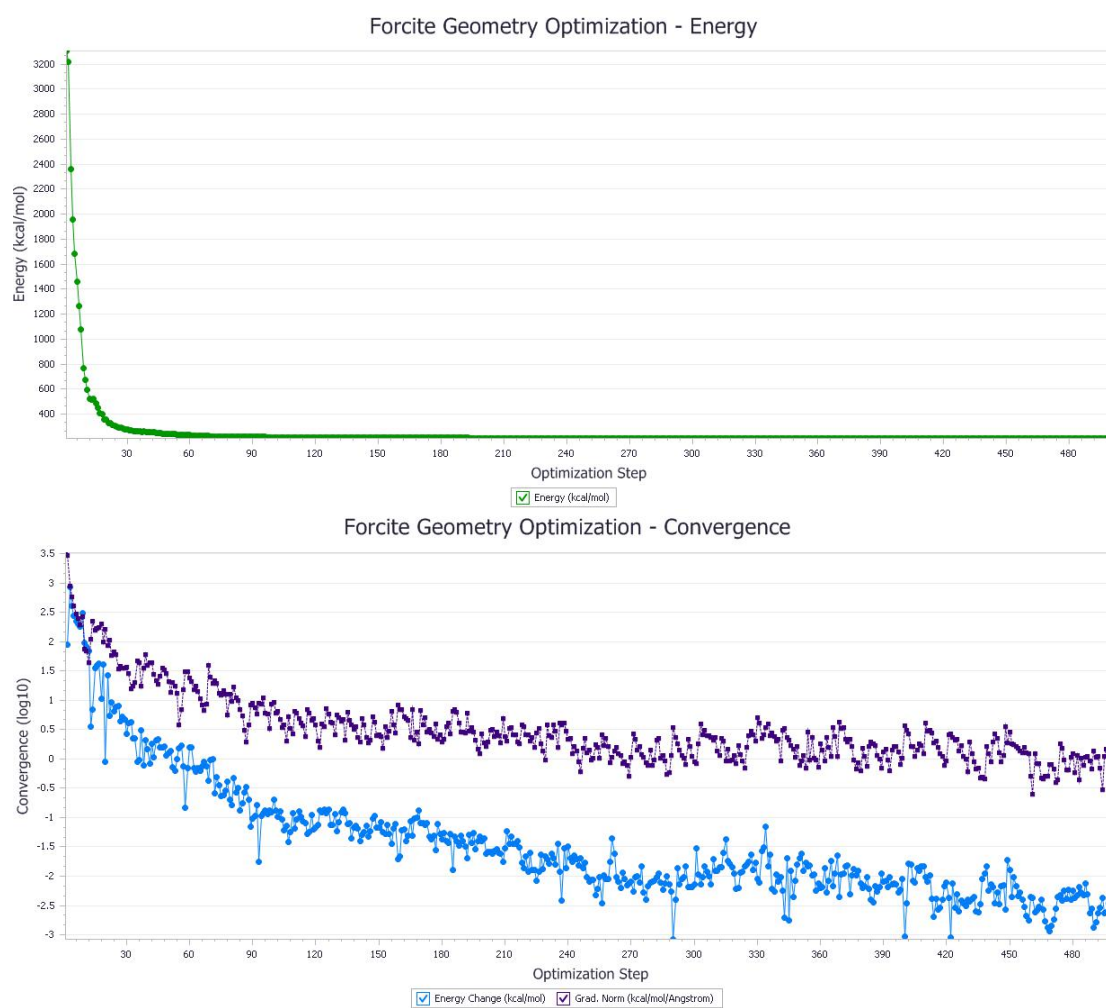


Figure S12. the energy and convergence of IL with β -1,4 Glucoside

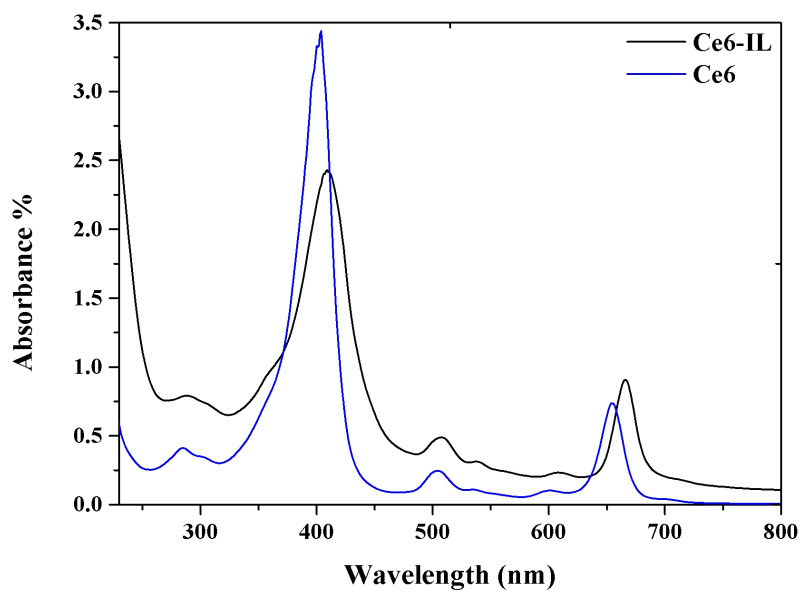


Figure S13. UV absorption spectroscopy of Ce6-IL

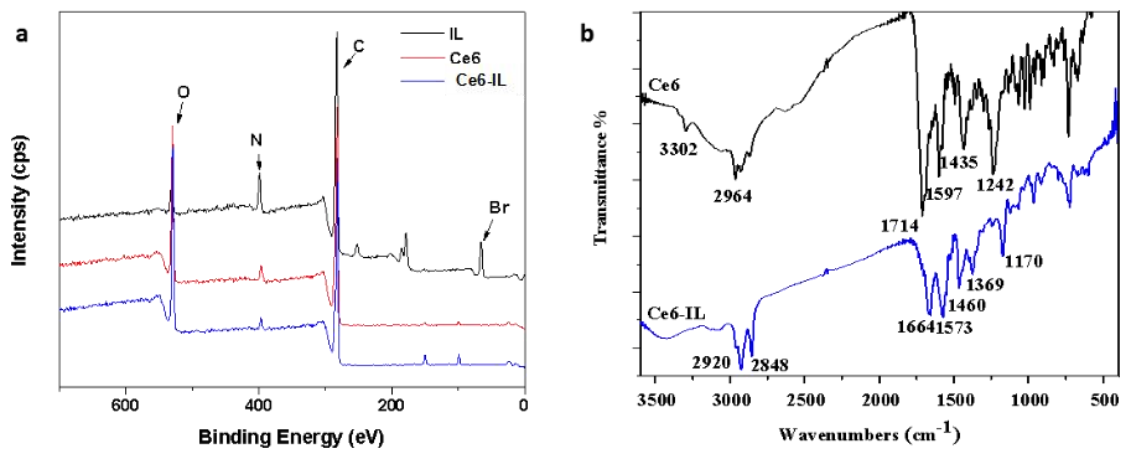


Figure S14. Wide scan of XPS (a) and FT-IR of Ce6-IL (b)

Channel name: 2: Average Time 0.9522 min : TOF MSe (50-2000) 6eV ESI+ : Centroided : Combined

1.39e4

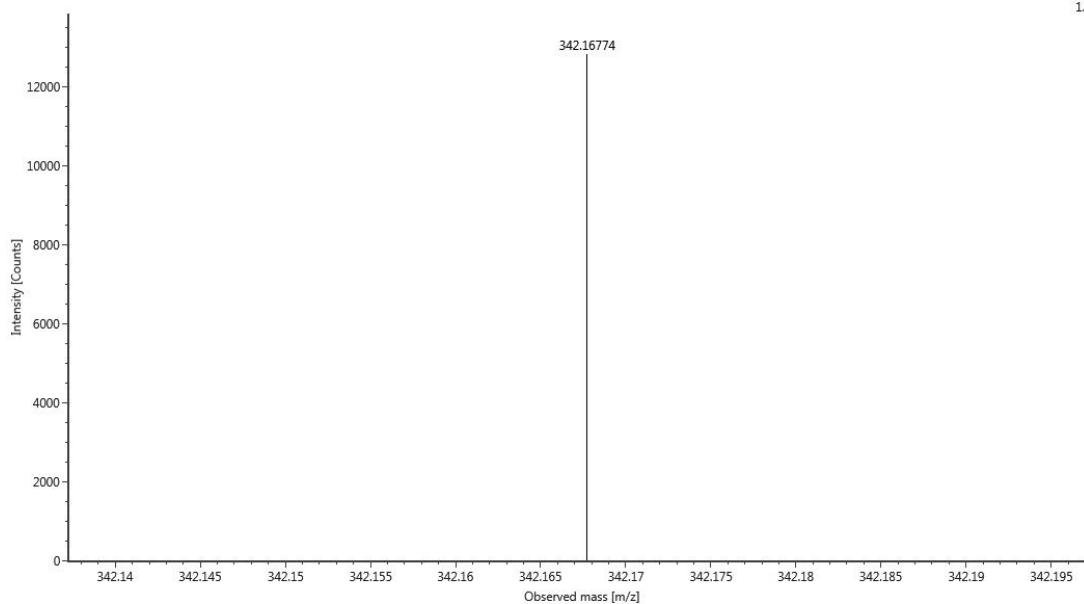


Figure S15. 1-vinyl-3-dodecyl imidazole bromide mass spectrometry
m/z: 342.1677, required m/z: 342.1671

Channel name: 2: Average Time 0.8835 min : TOF MSe (50-2000) -6eV ESI- : Centroided : Combined

8.33e5

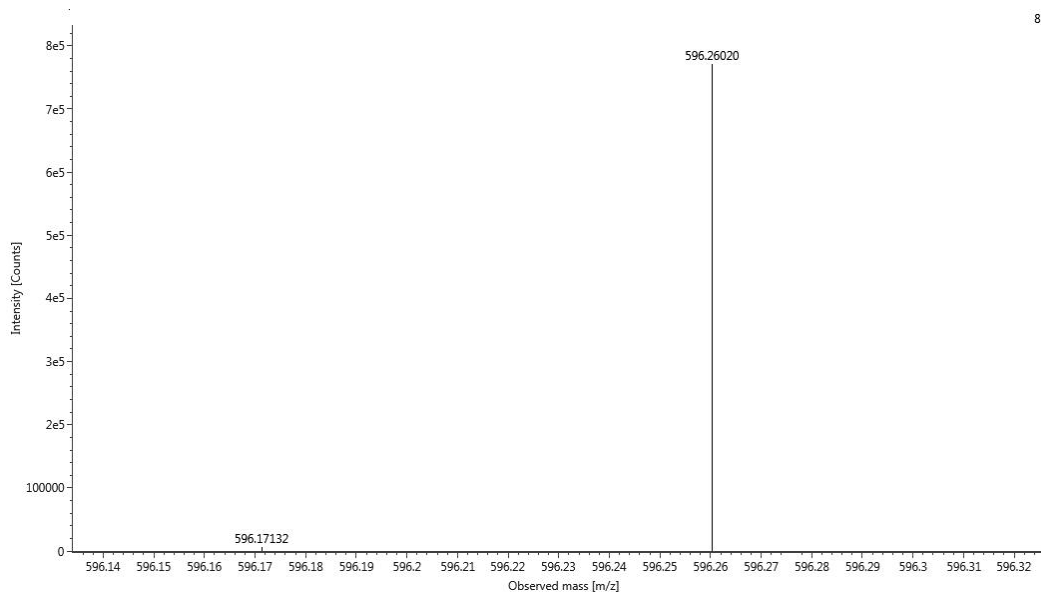


Figure S16. Ce6 mass spectrometry
m/z: 596.2602, required m/z: 597.2635

Channel name: 2: Average Time 1.0554 min : TOF MSe (50-2000) 6eV ESI+ : Centroided : Combined

1.08e4

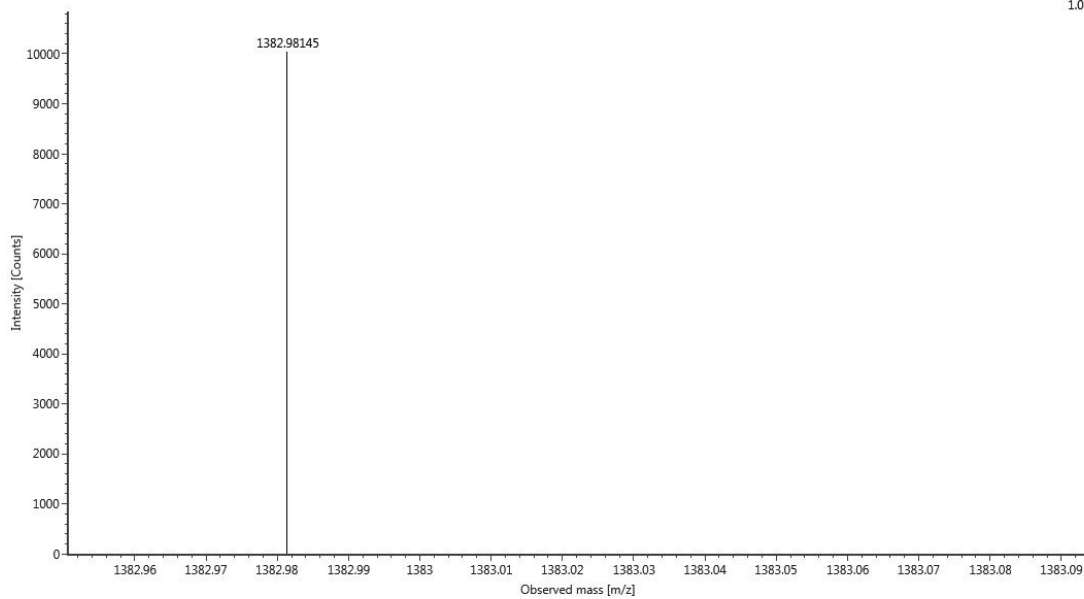


Figure S17. Ce6-IL mass spectrometry
m/z: 1382.9815, required m/z:1382.9862

Channel name: 2: Average Time 0.3781 min : TOF MSe (50-2000) -6eV ESI- : Centroided : Combined

8e3

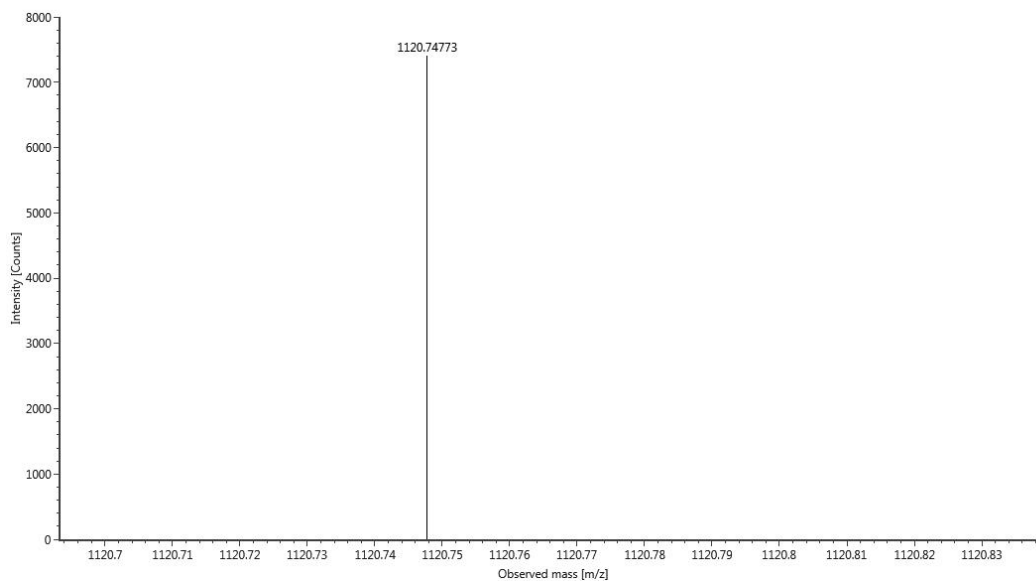


Figure S18. Ce6-IL at pH 5.5 mass spectrometry
m/z: 1120.7477, required m/z:1120.7453

Channel name: 2: Average Time 1.2169 min : TOF MSe (50-2000) -6eV ESI- : Centroided : Combined

1.63e3

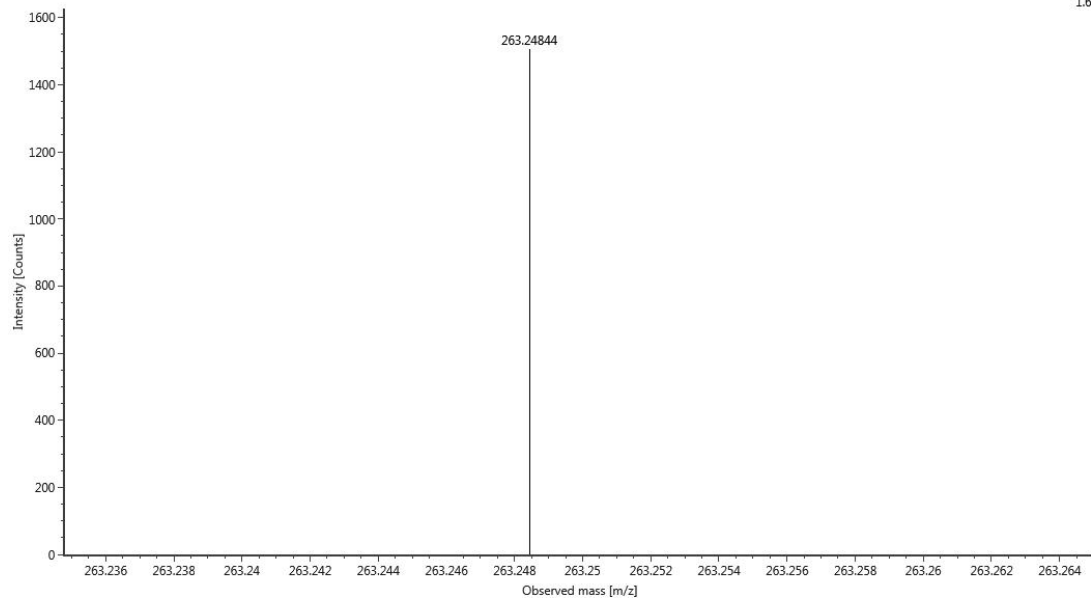


Figure S19. Cation 1-vinyl-3-dodecyl imidazole in Ce6-IL at pH 5.5 mass spectrometry
 m/z : 263.2484, required m/z : 263.2482

Channel name: 2: Average Time 0.8010 min : TOF MSe (50-2000) -6eV ESI- : Centroided : Combined

1.07e4

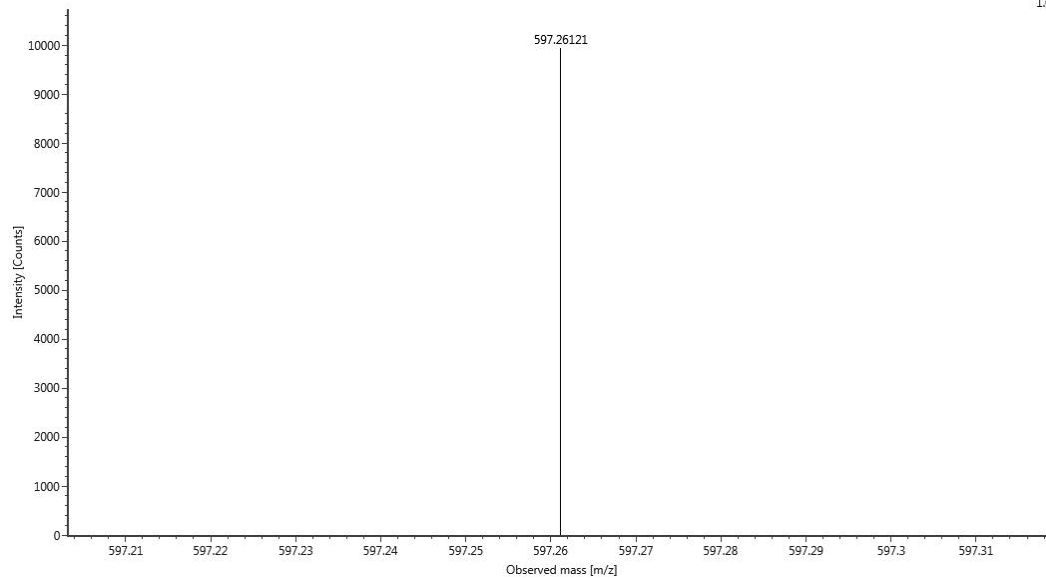


Figure S20. Ce6 in the Ce6-IL at pH 4.5 mass spectrometry
 $m/z(M+H)$: 597.2612, required m/z : 597.2635

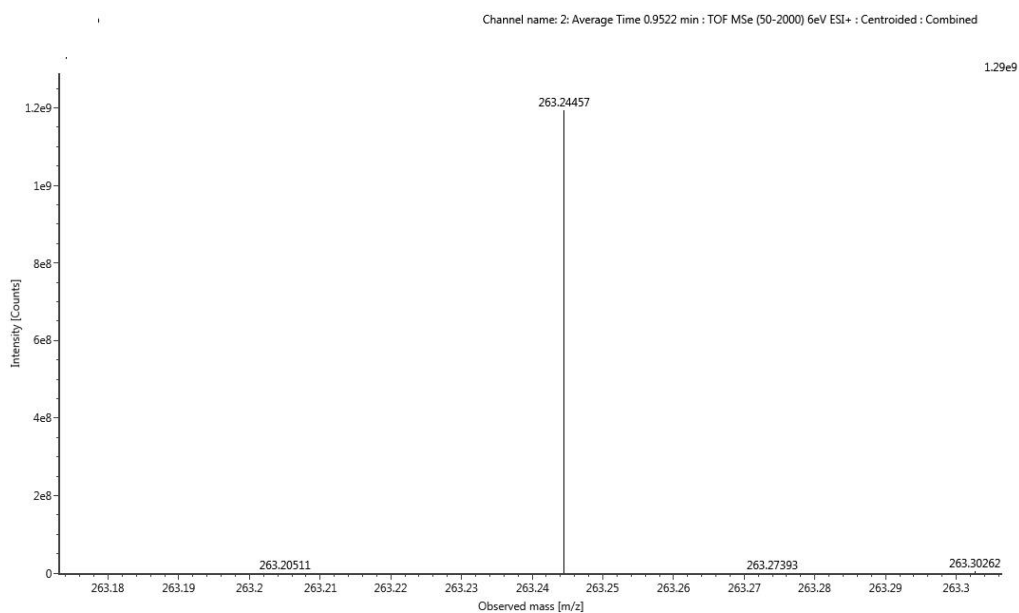


Figure S21. Cation 1-vinyl-3-dodecyl imidazole in Ce6-IL at pH 4.5 mass spectrometry
m/z: 263.2446, required m/z: 263.2482

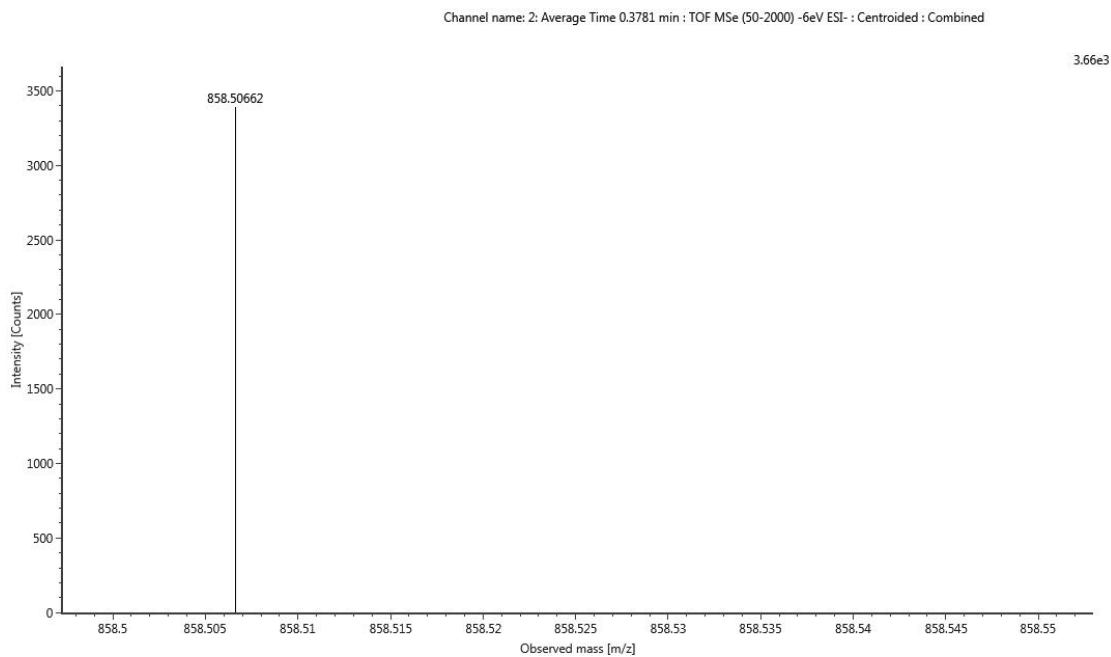


Figure S22. Ce6-IL at pH 4.5 mass spectrometry
m/z: 858.5066, required m/z: 858.5044

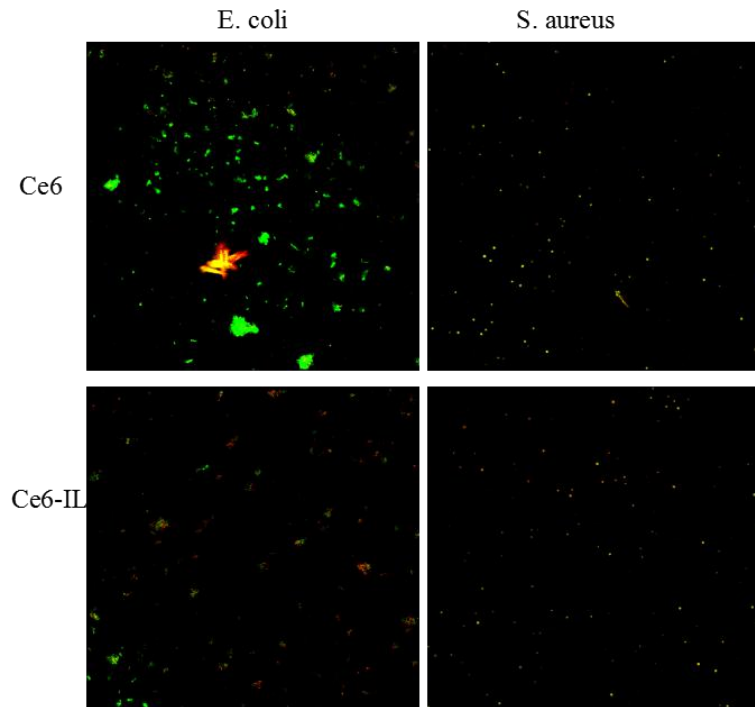


Figure S23. Fluorescence microscope images of Ce6-IL and Ce6 with E.Coli and S.aureus after 30 min irradiation with 660 nm light. Green staining indicates live bacteria, and red staining indicates dead bacteria, the magnification is 40 times.

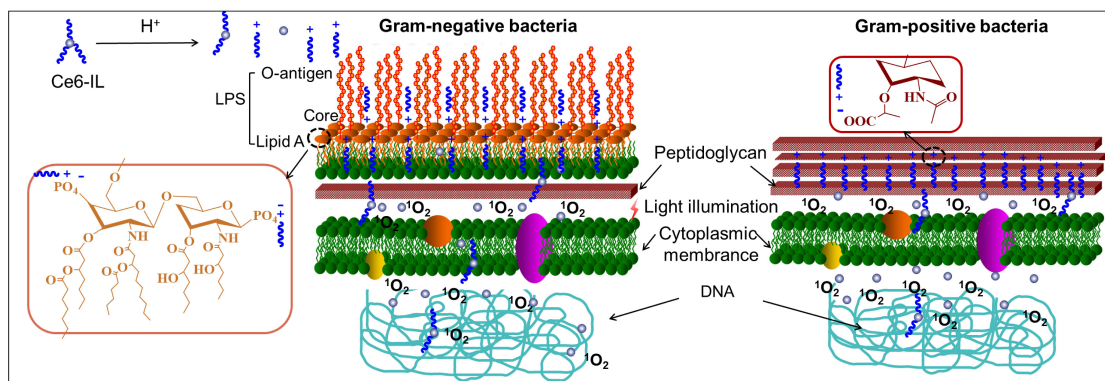


Figure S24. The dual-mode antibacterial mechanism of Ce6-IL