

Supplementary Materials

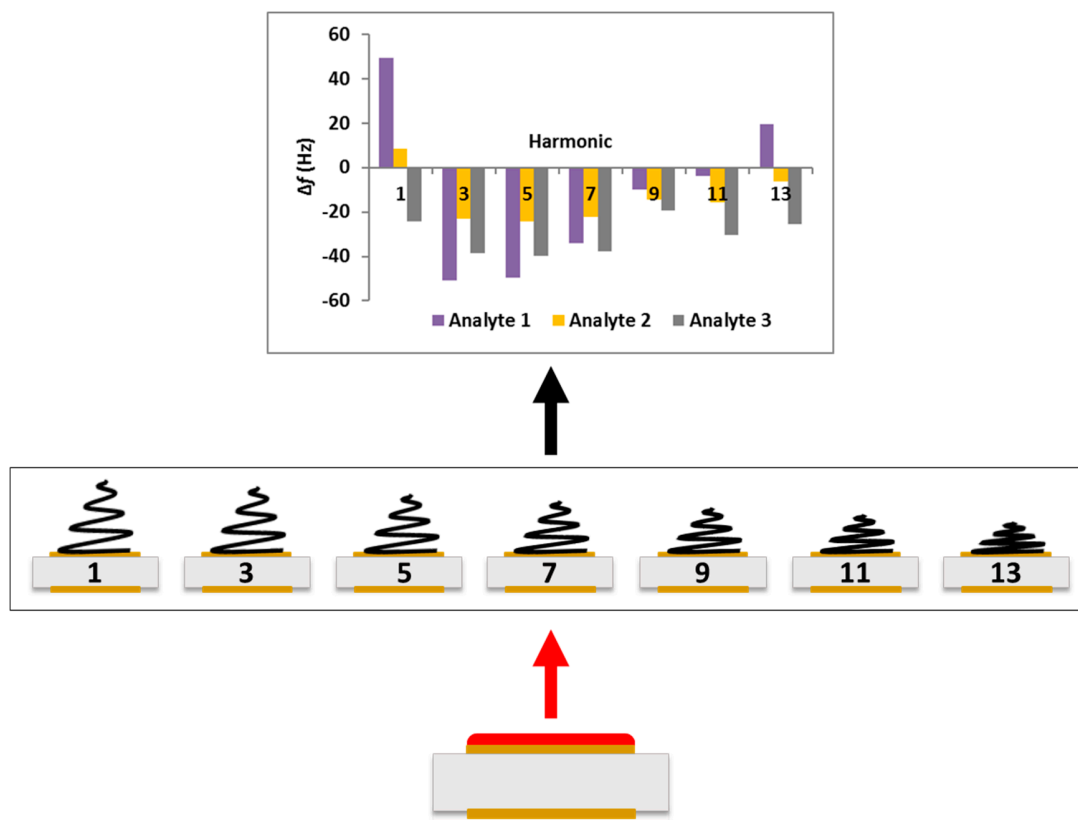


Figure S1. Schematic of QCM-based VSA. Red represents one chemically coated sensor that produces multiple responses. Smaller sensors labeled 1 – 13 represent “imaginary” sensors. The graph is a visual representation of the analyte specific responses generated by each sensor.

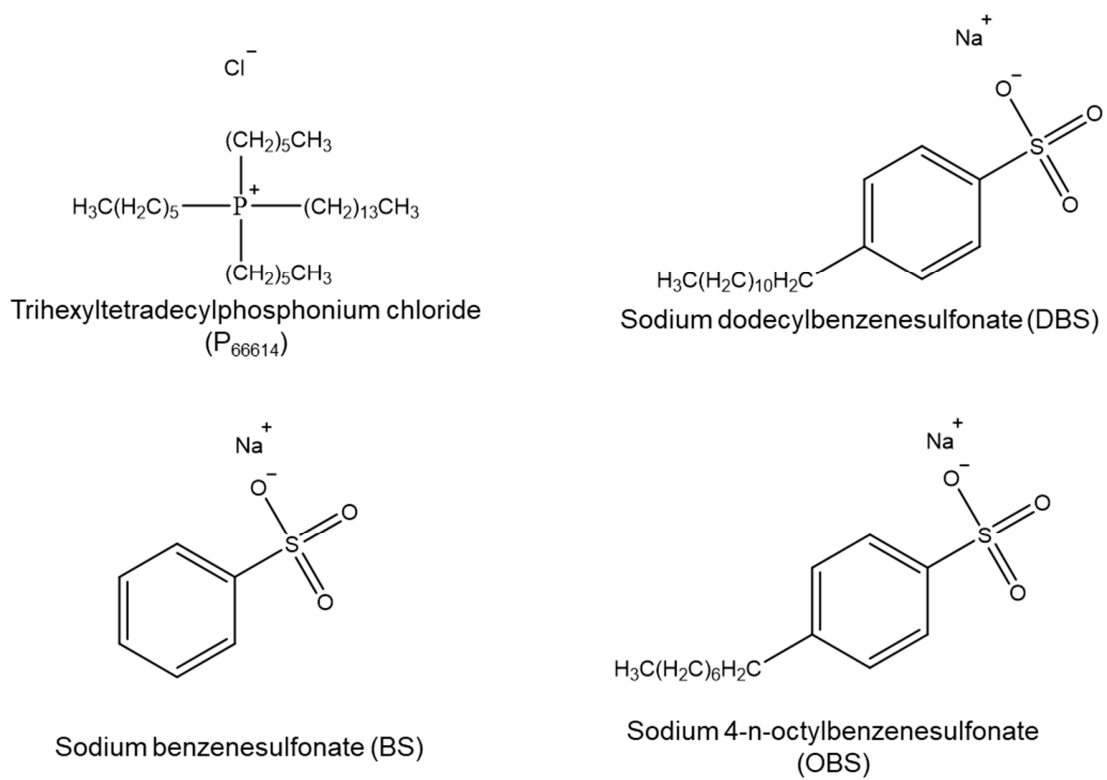


Figure S2. Structures of starting materials used to synthesize ILs

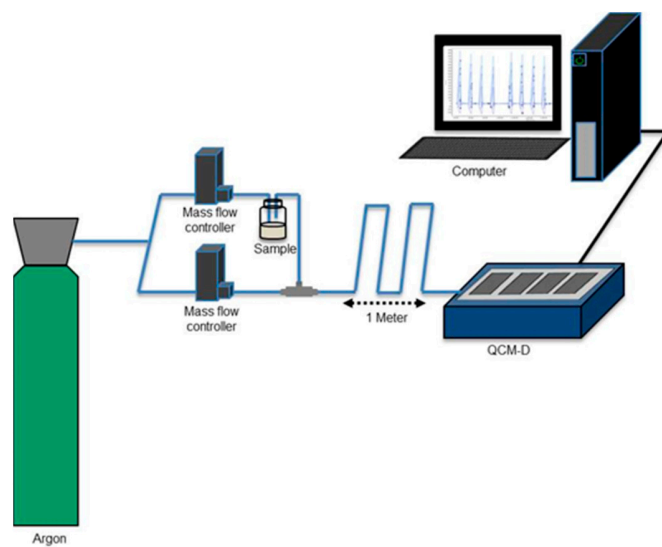


Figure S3. Schematic of QCM flow system.

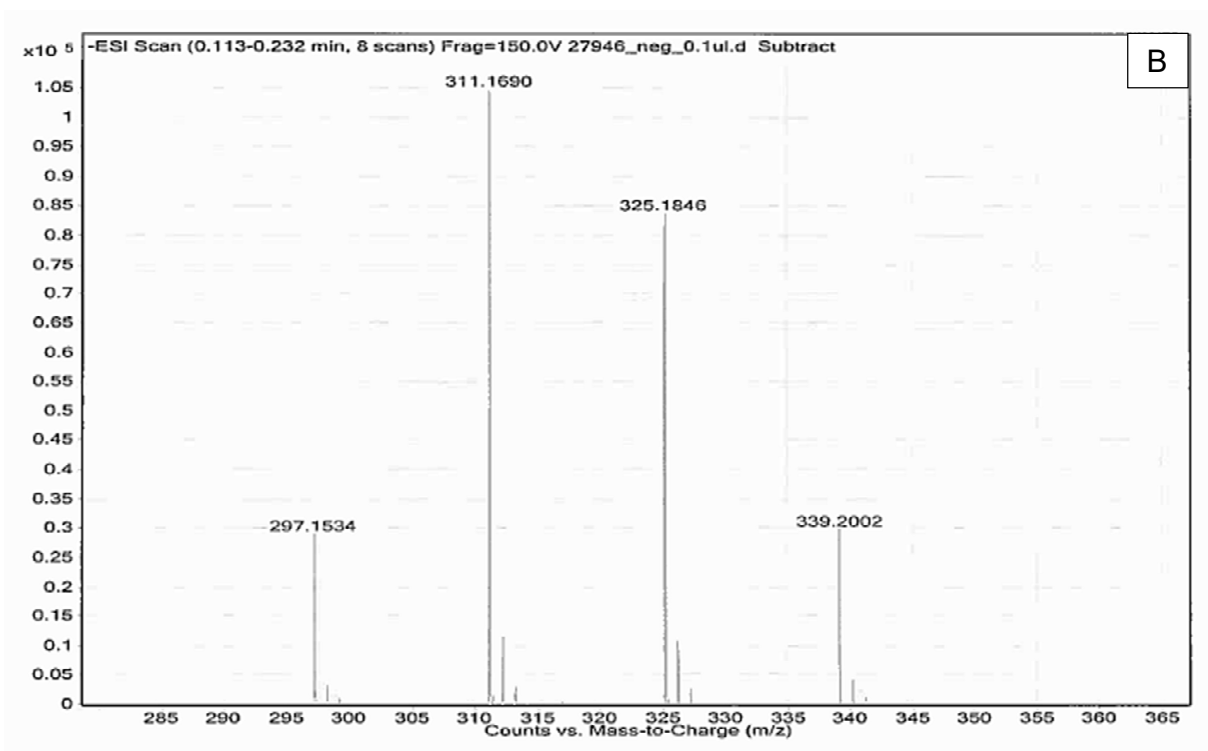
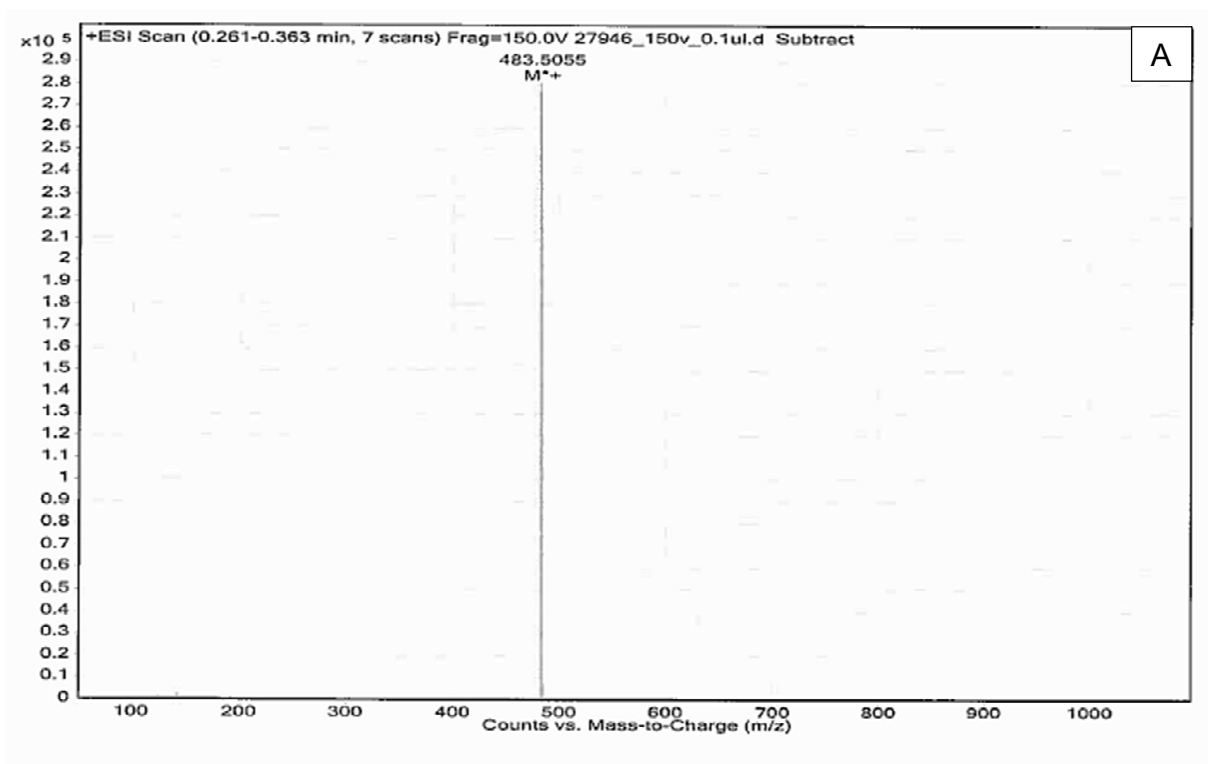


Figure S4. Electrospray ionization mass spectrometry (ESI-MS) spectra for [P₆₆₆₁₄][DBS], where A) is in positive mode and B) is in negative mode. Solvent used was DCM.

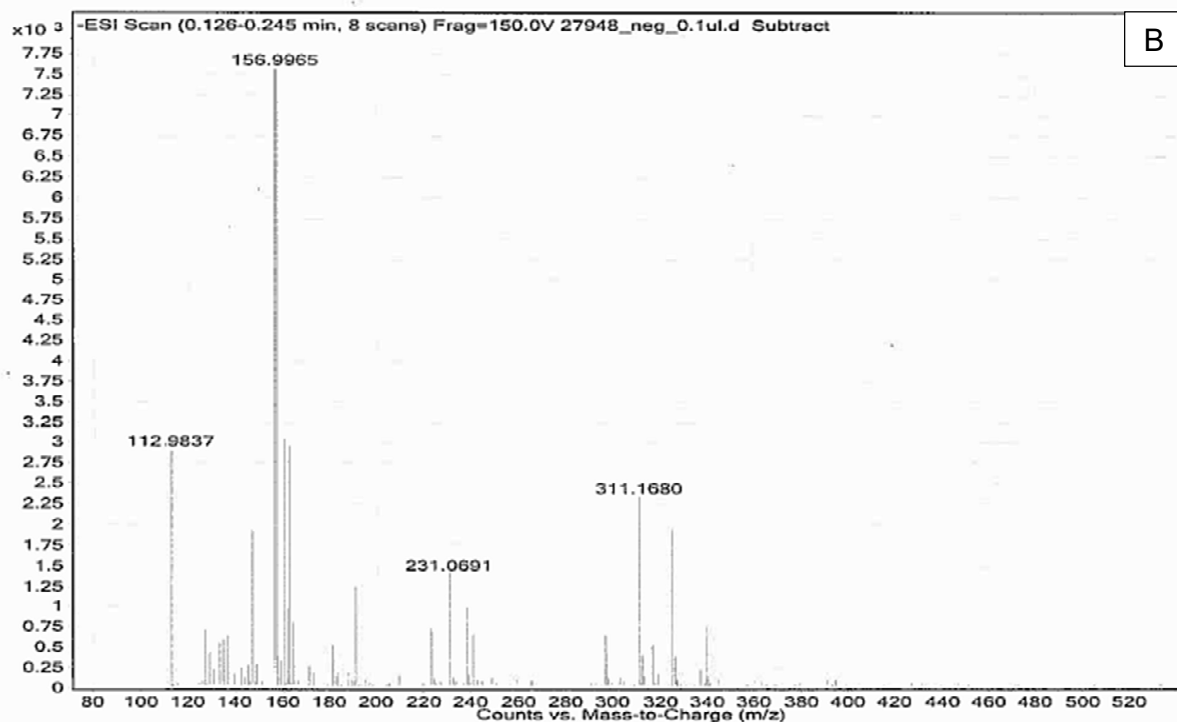
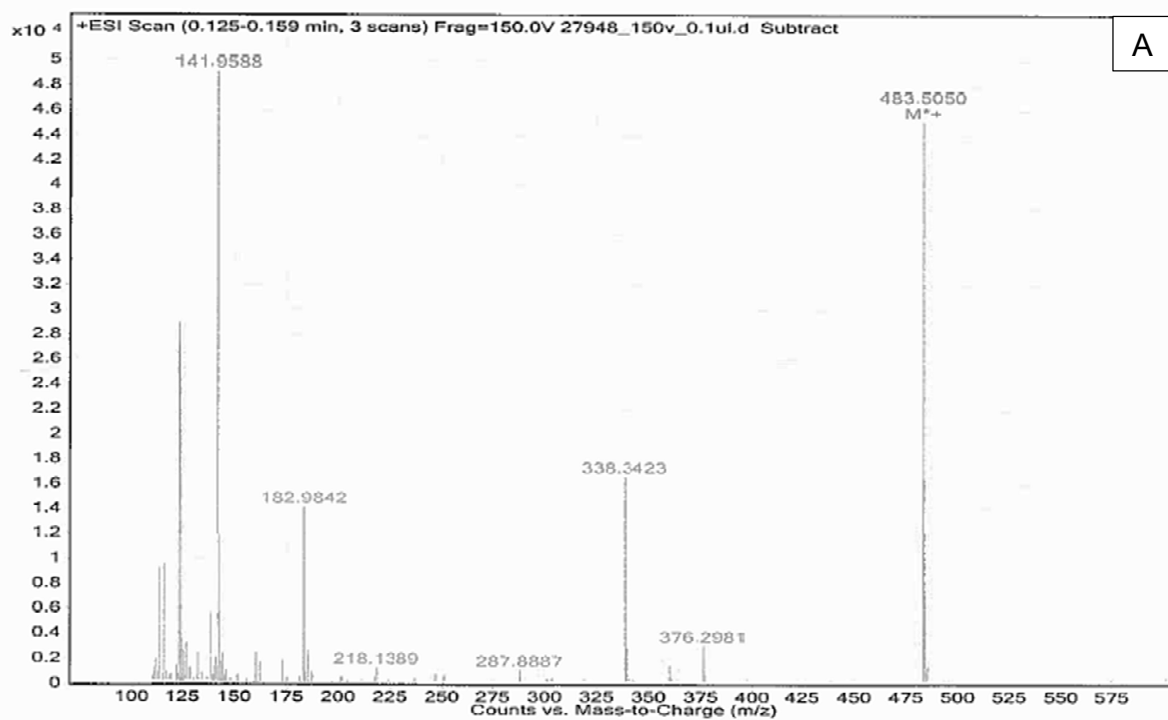


Figure S5. Electrospray ionization mass spectrometry (ESI-MS) spectra for $[P_{66614}][BS]$, where A) is in positive mode and B) is in negative mode. Solvent used was DCM.

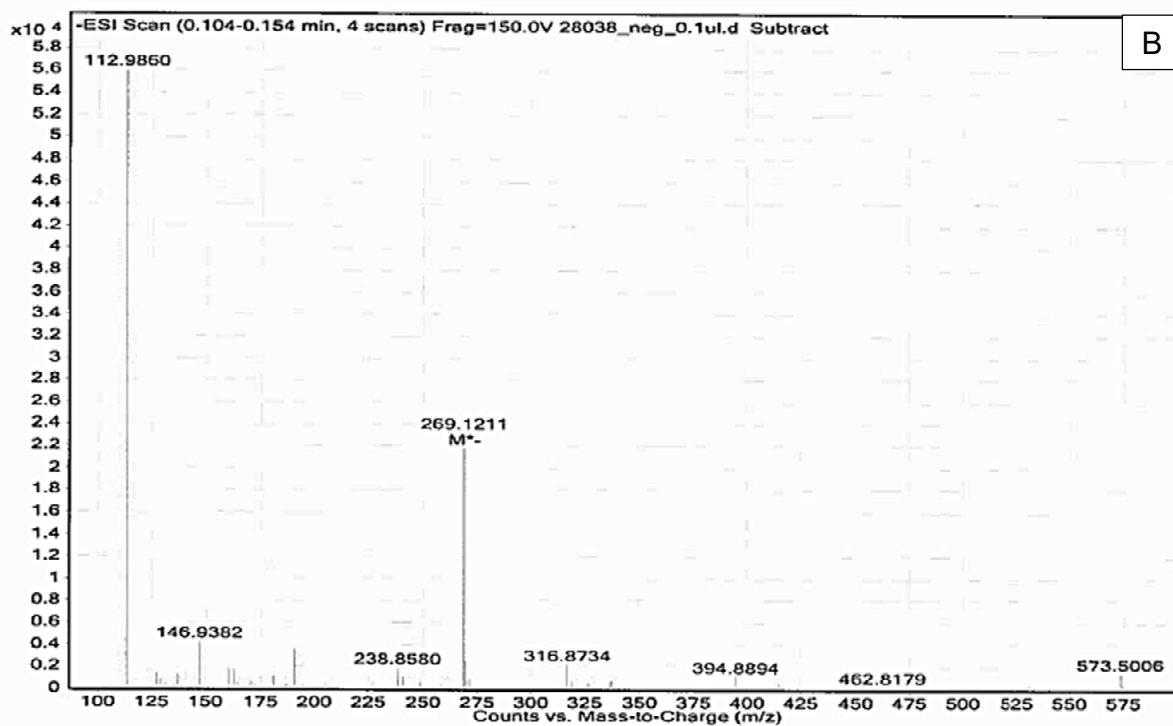
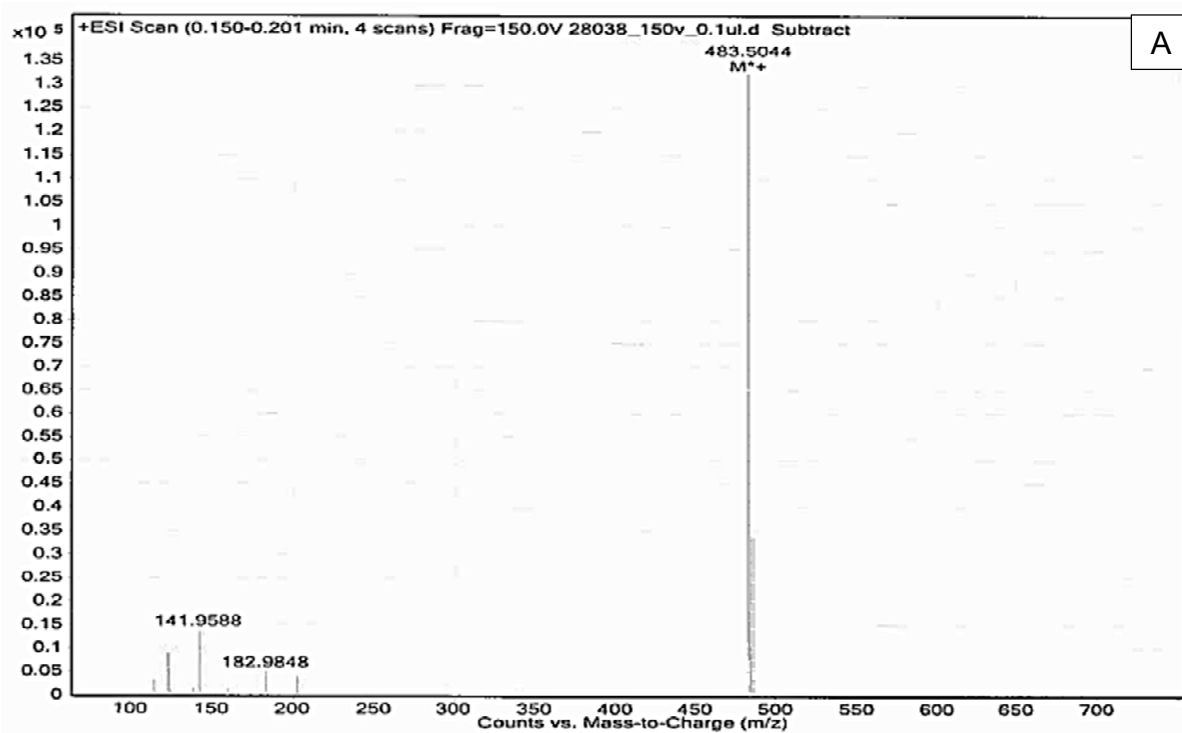


Figure S6. Electrospray ionization mass spectrometry (ESI-MS) spectra for [P₆₆₆₁₄][OBS], where A) is in positive mode and B) is in negative mode. Solvent used was DCM.

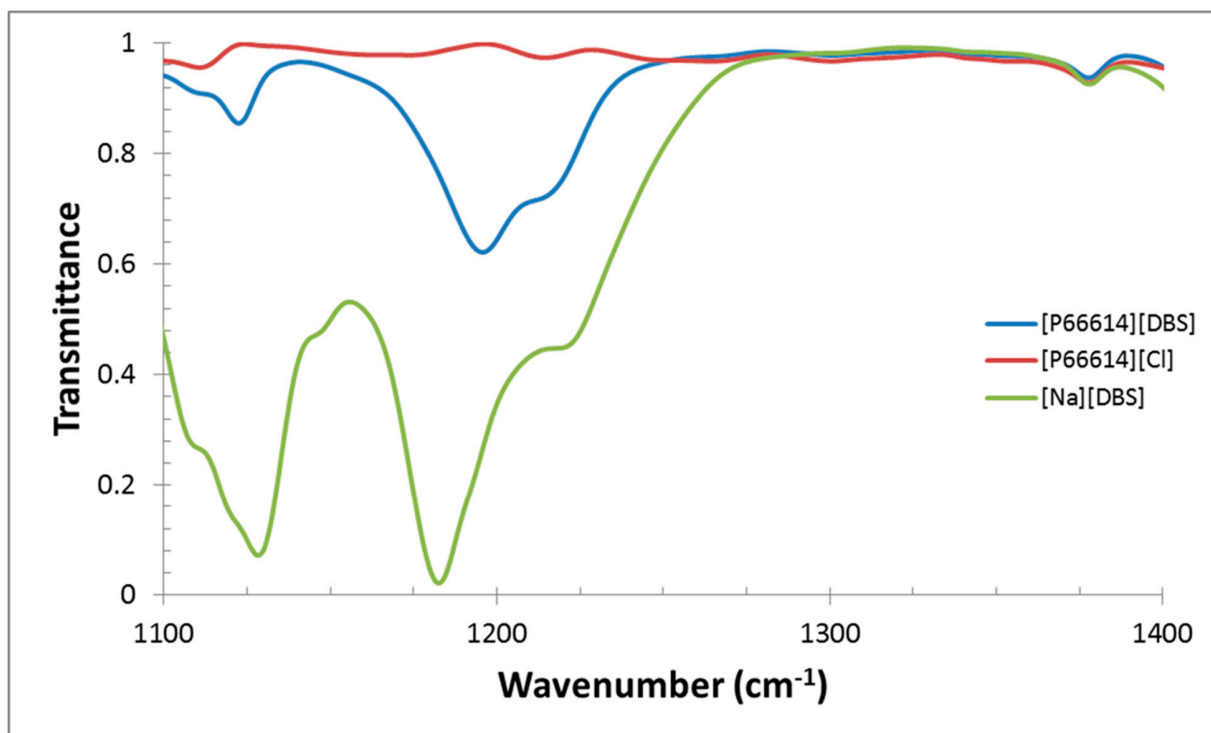


Figure S7. Fourier transform infrared (FT-IR) spectra for [P₆₆₆₁₄][DBS]. S=O stretching in DBS ~1182 shifts to ~1195 in [P₆₆₆₁₄][DBS].

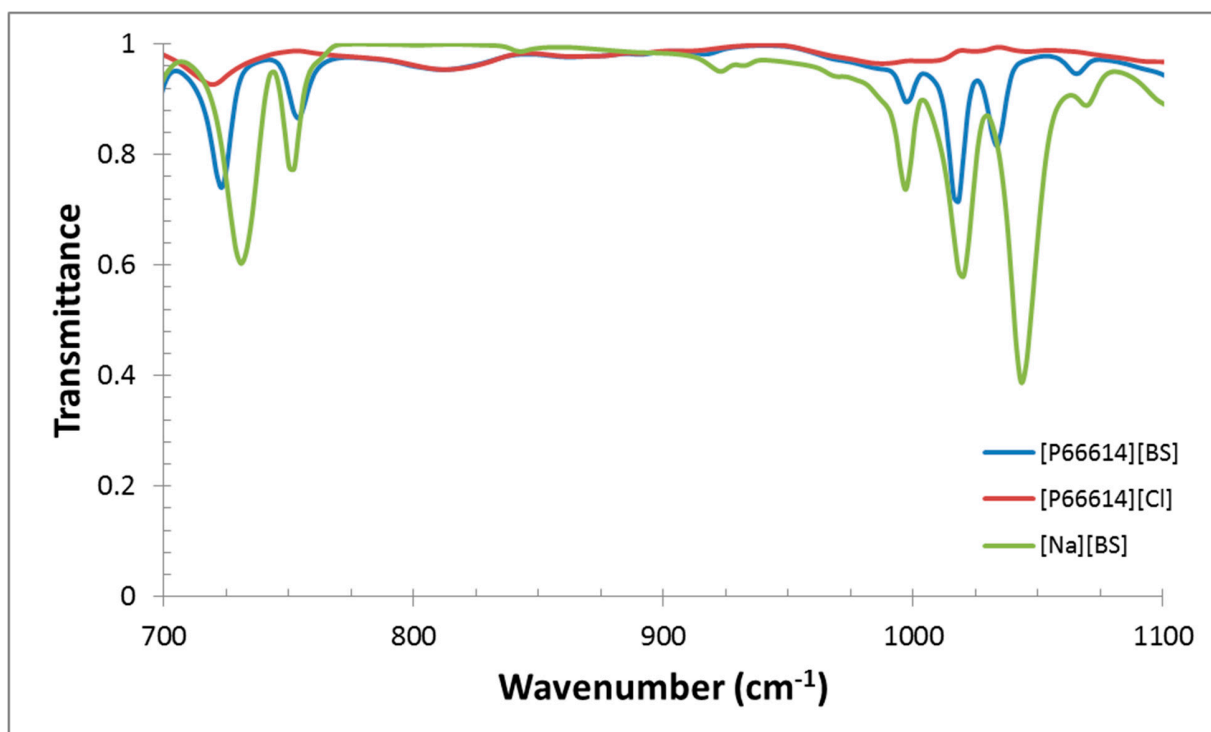


Figure S8. Fourier transform infrared (FT-IR) spectra for [P₆₆₆₁₄][BS]. S-O stretching in BS ~732 shifts to ~725 and ~750 shifts to ~755 in [P₆₆₆₁₄][BS].

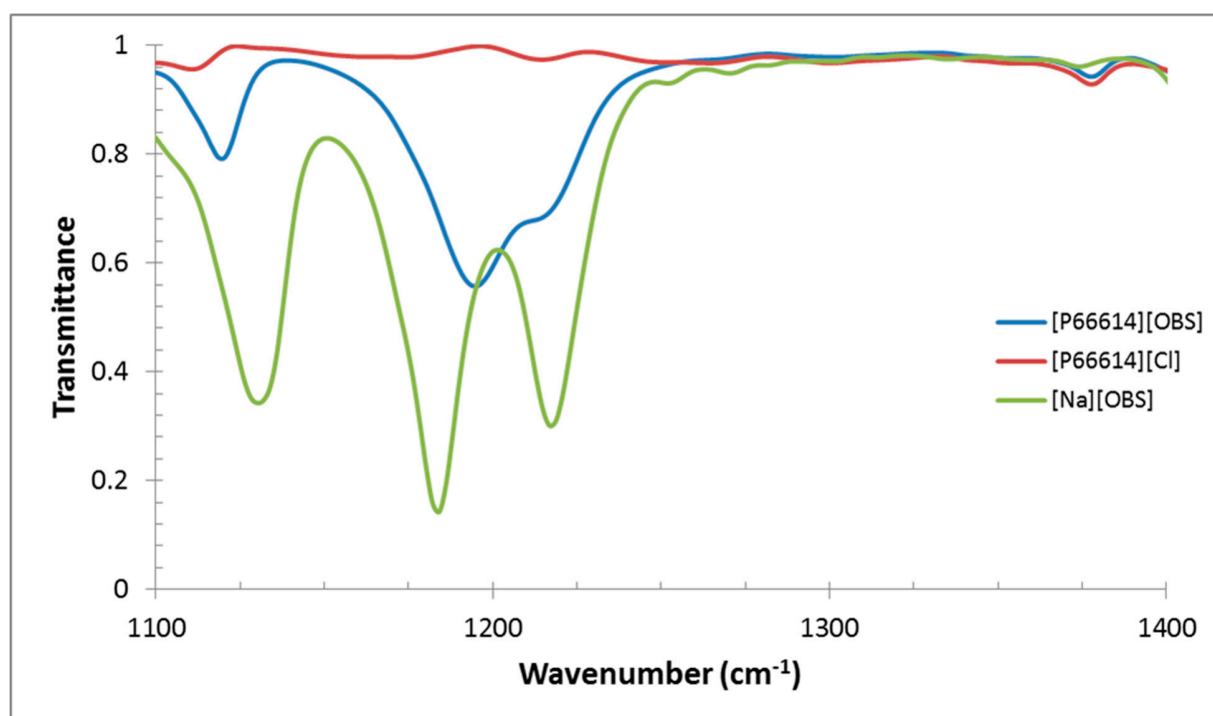


Figure S9. Fourier transform infrared (FT-IR) spectra for [P₆₆₆₁₄][OBS]. S=O stretching in OBS ~1184 shifts to ~1195 in [P₆₆₆₁₄][OBS].

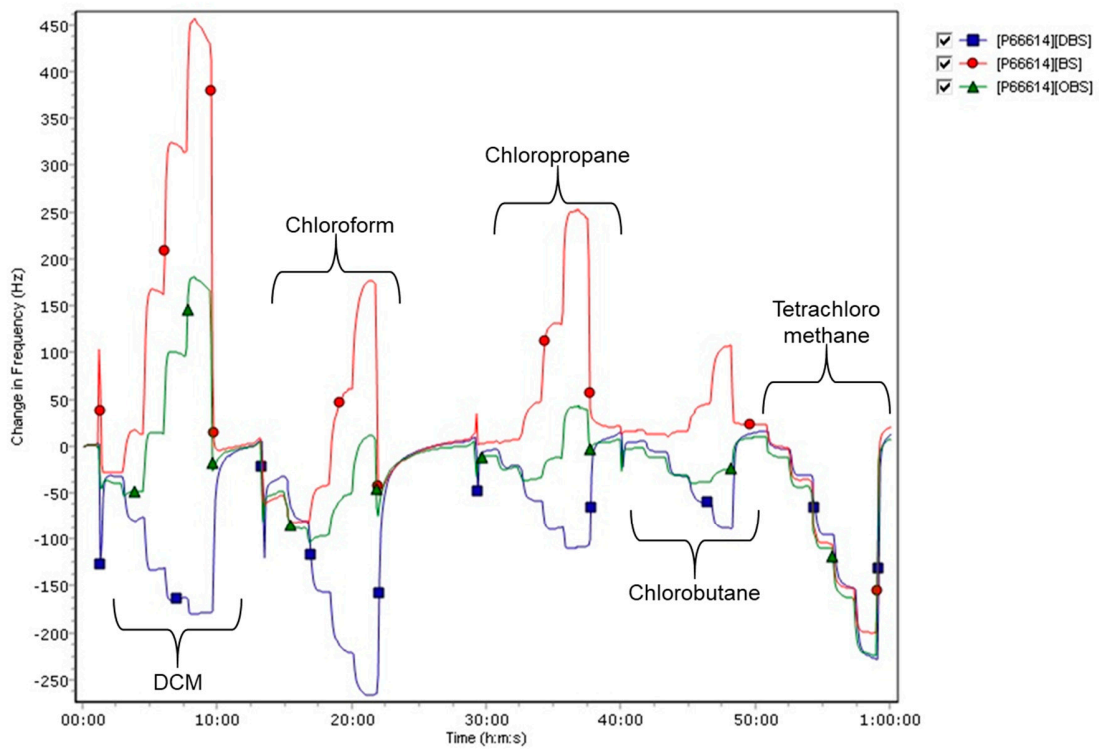


Figure S10. Sensorgram for first replicate measurement. Braces indicate the VOC being measured at multiple flow ratios in 3-minute increments.

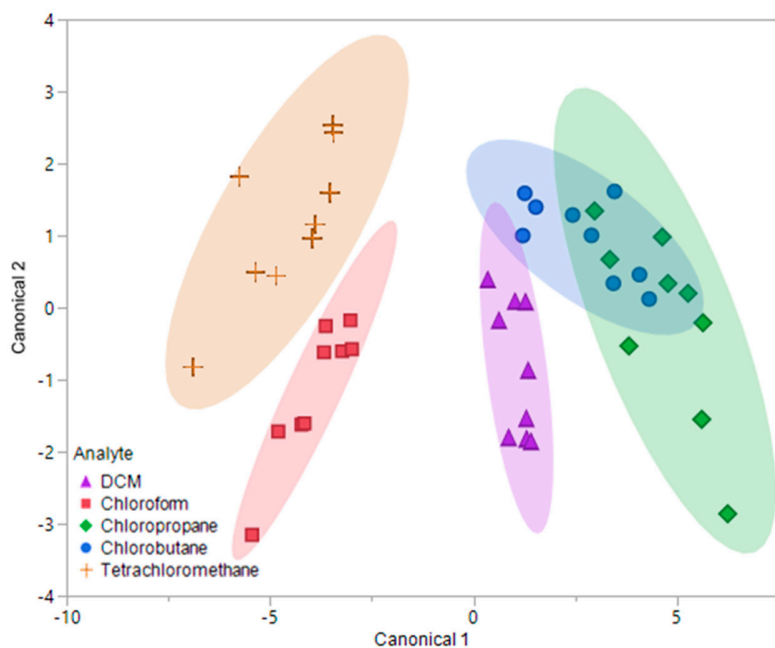


Figure S11. Canonical plot for discrimination of five chlorinated VOCs with respect to a five sensor VSA. Plot considers 45 total measurements consisting of three replicate measurements at three different flow ratios for each VOC (9 measurements per sample) using [P₆₆₆₁₄][DBS]-PDMS.

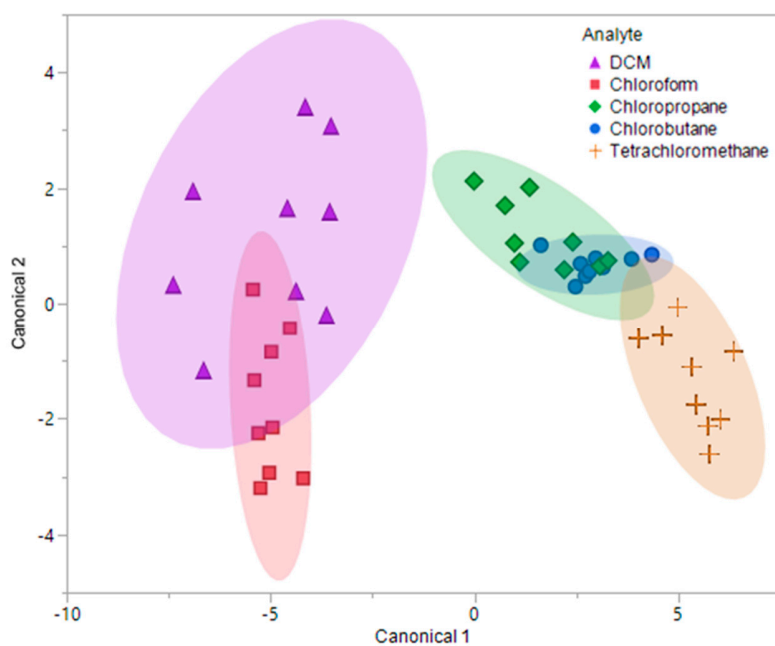


Figure S12. Canonical plot for discrimination of five chlorinated VOCs with respect to a four sensor VSA. Plot considers 45 total measurements consisting of three replicate measurements at three different flow ratios for each VOC (9 measurements per sample) using [P₆₆₆₁₄][BS]-PDMS.

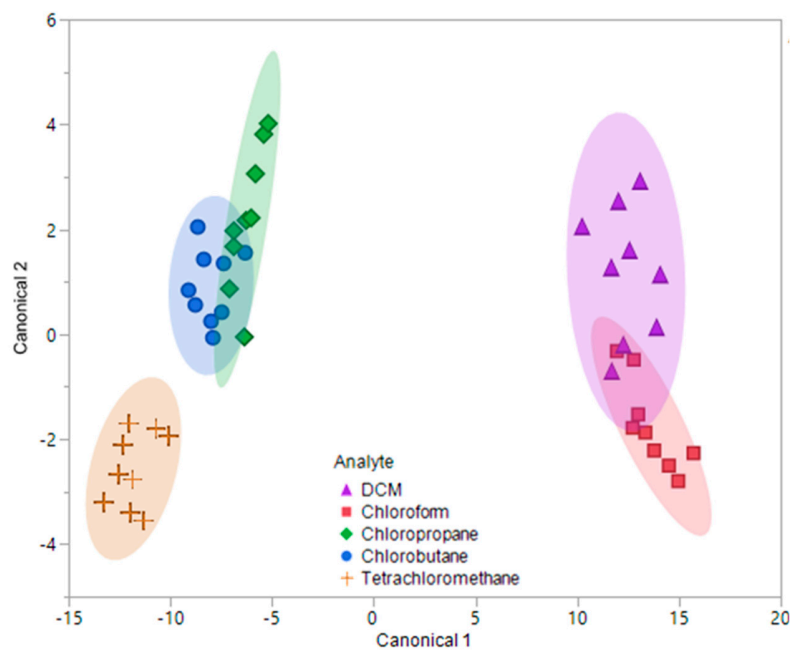


Figure S13. Canonical plot for discrimination of five chlorinated VOCs with respect to a six sensor VSA. Plot considers 45 total measurements consisting of three replicate measurements at three different flow ratios for each VOC (9 measurements per sample) using [P₆₆₆₁₄][OBS]-PDMS.