

Electronic Supplementary Material

Effects of magnetic ionic liquid as a lubricant on the friction and wear behavior of a steel-steel sliding contact under elevated temperatures

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Supporting information to <https://doi.org/10.1007/s40544-019-0324-0>

Characterization: Fourier transform infrared (FTIR) spectrum was recorded on a Brucker VERTEX 70 spectrometer. An element analysis instrument (Elementar Vario EL cube) was performed to determine the content of C, H, N and S elements in MIL (theoretical C: 47.60, H: 6.54, N: 17.23, S: 17.53; found C: 47.58, H: 6.58, N: 17.31, S: 17.43).

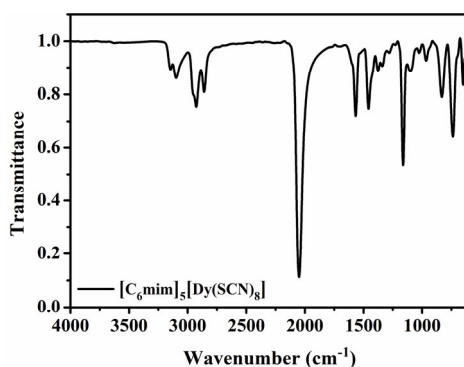


Fig. S1 FTIR spectrum of magnetic ionic liquid.

The spectrum presents the characteristic thiocyanate FTIR peak at approximately 2050 cm⁻¹ for as-prepared magnetic ionic liquid [1, 2]. The bands near 2900 cm⁻¹ are present for C–H stretching of ν_{CH_3} and ν_{CH_2} [3].

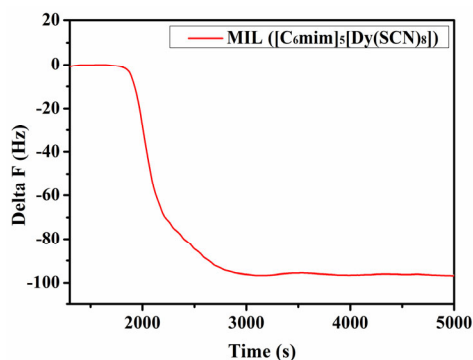


Fig. S2 The changing frequency of QCM using gold chip with MIL.

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The QCM was employed to study the adsorbability of MIL on the gold chip surface. When 1 wt% MIL in ethanol is pumped into the instrument, the frequency shifts from 0 Hz to −96.4 Hz. This indicates that MIL has excellent adsorption performance on the surface of metal gold chip [4].

References

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