

Tribochemistry and thermo-oxidative stability of halogen-free ionic liquids

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Electronic supplementary information (ESI)

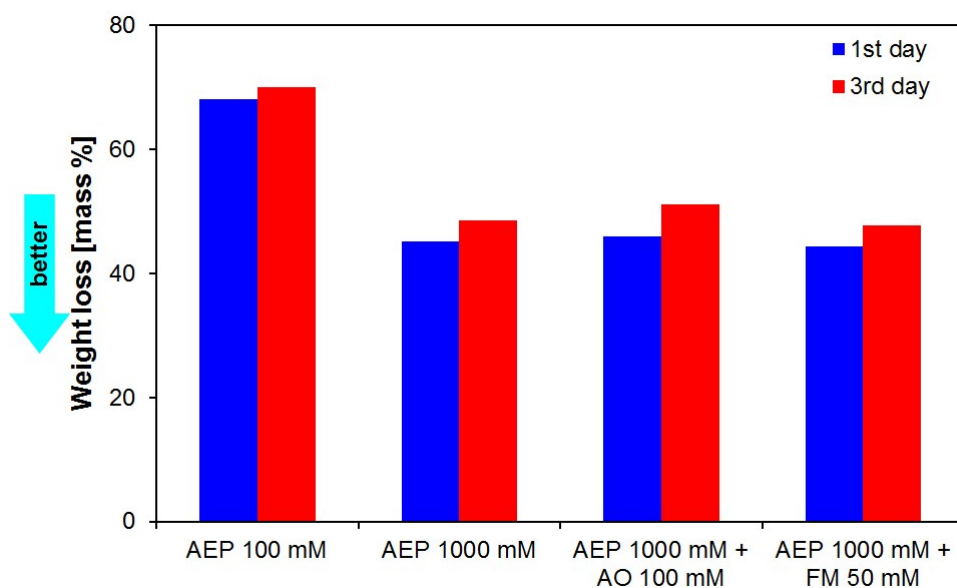


Figure S1. Weight loss at constant-temperature of 100 °C during the 1st and 3rd day. It shows that most of the weight loss occurred during the first 3 days.

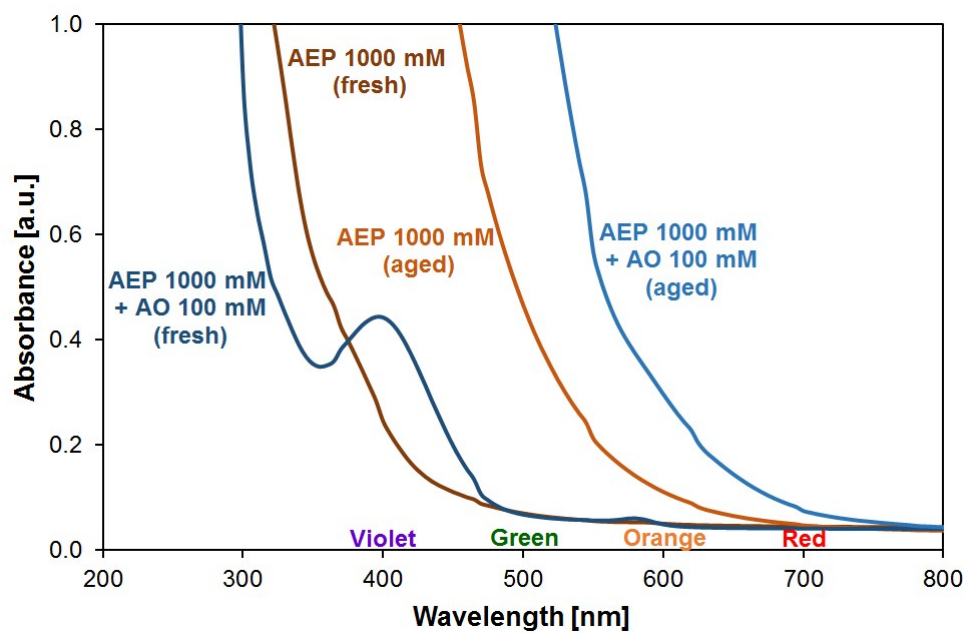


Figure S2. UV-VIS spectra for AEP 1000 mM + AO 100 mM compared to AEP 1000 mM in fresh and altered conditions (for 7 days). It shows the differences in the colors for the two mixtures. The colors at their characteristic wavelengths are indicated.

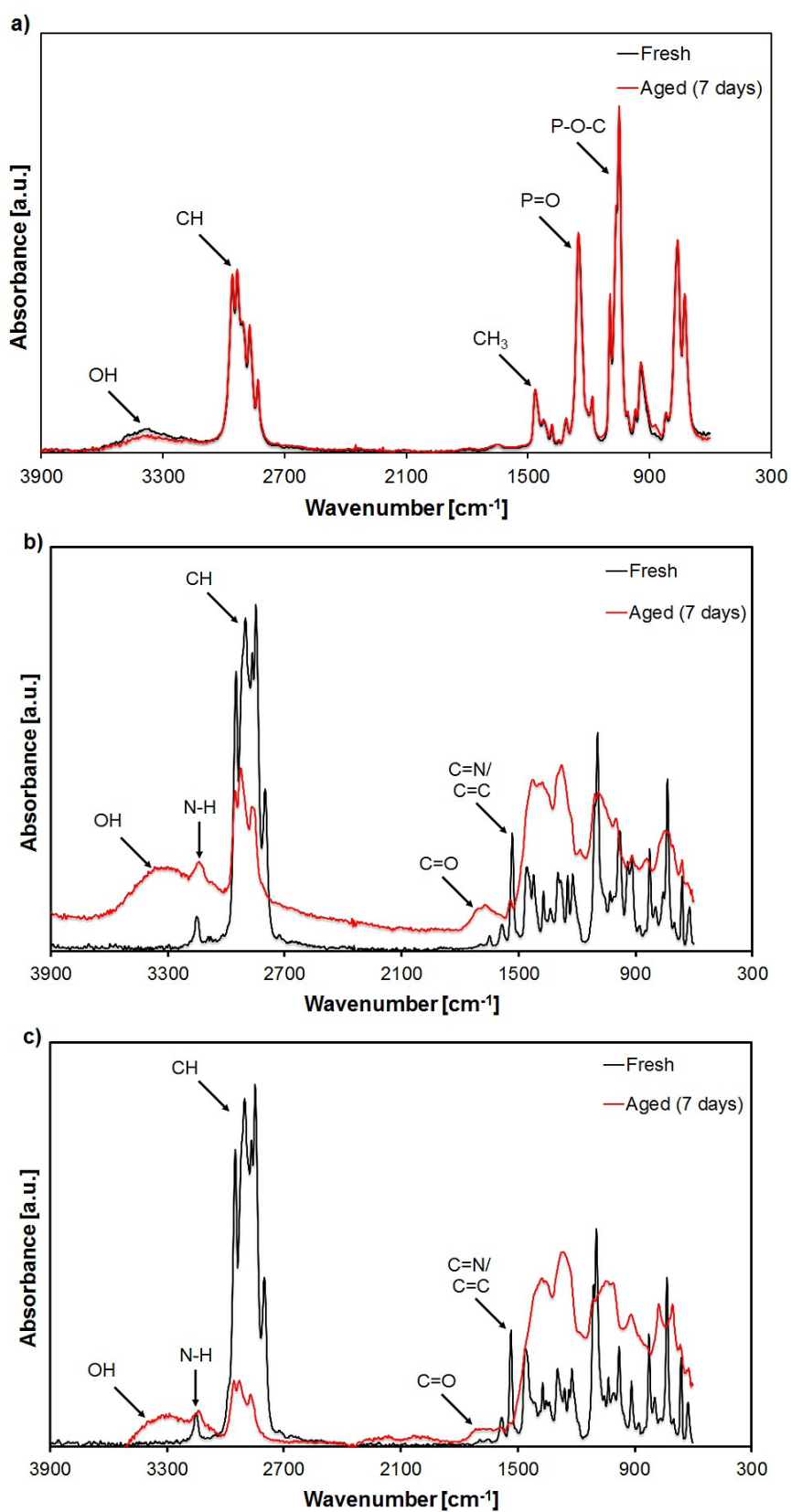


Figure S3. FTIR spectra of neat fluids in fresh and altered condition: tributylmethylphosphonium dimethylphosphate (a); N-allylimidazole trybutylborane (b) and N-ethylimidazole trybutylborane (c)

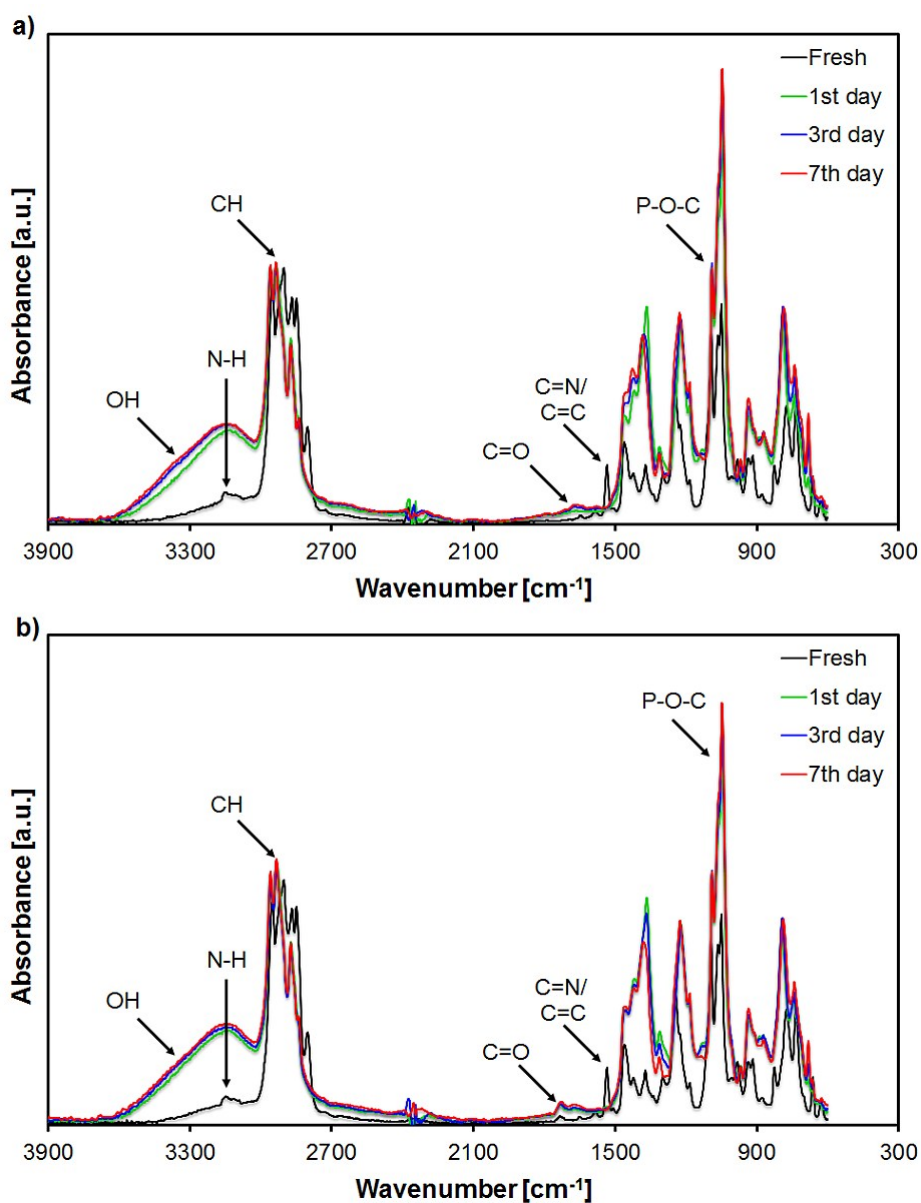


Figure S4. FTIR spectra of AEP 1000 mM + AO 100 mM (a) and AEP 1000 mM + 50 FM (b) showing no significant changes between the two artificially altered samples as displayed in the mass loss results from Figs. 3 and S1.

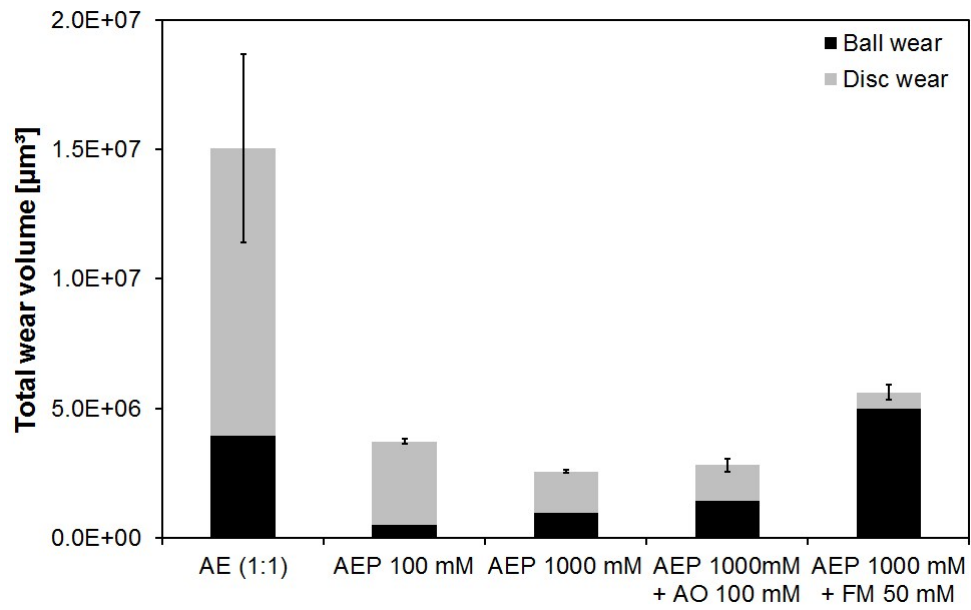


Figure S5. Total wear volume of both counterparts: balls and discs

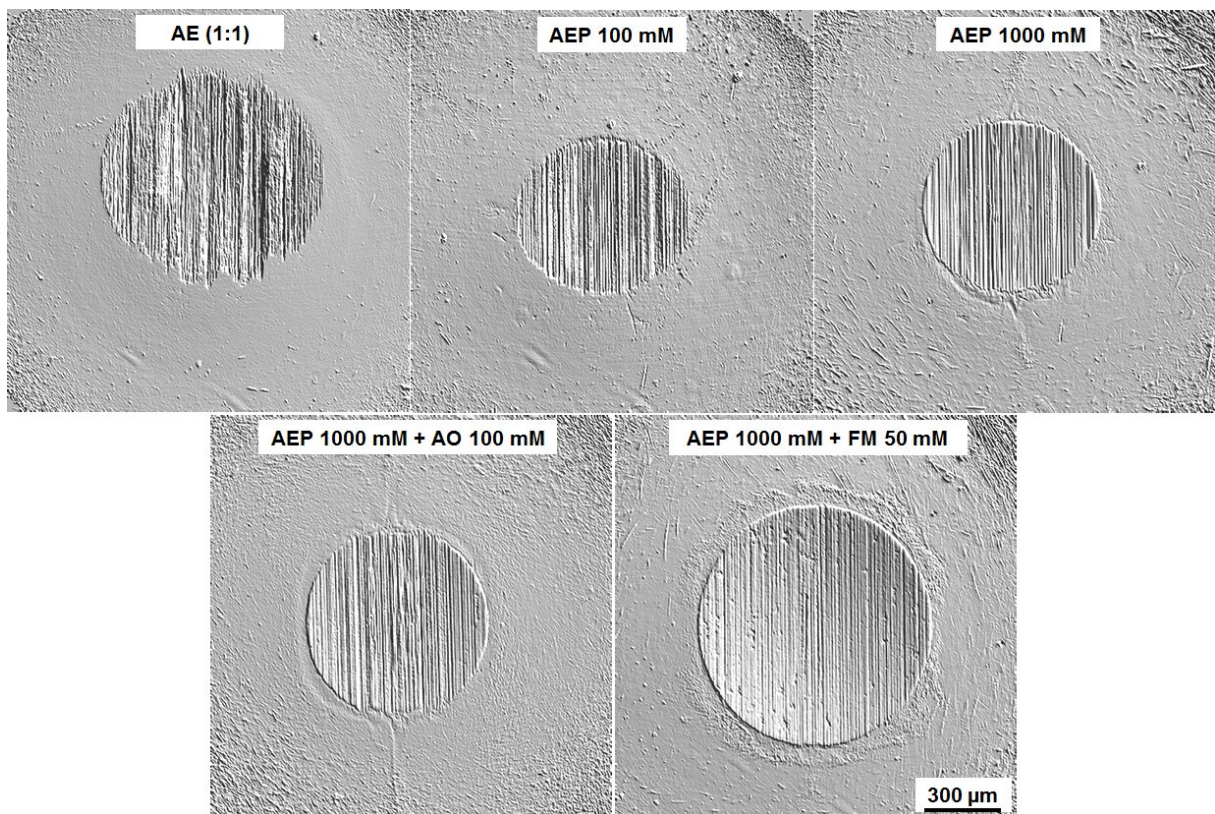


Figure S6. Surface topography showing the wear scars on the balls (the same scale is valid for all the micrographs)

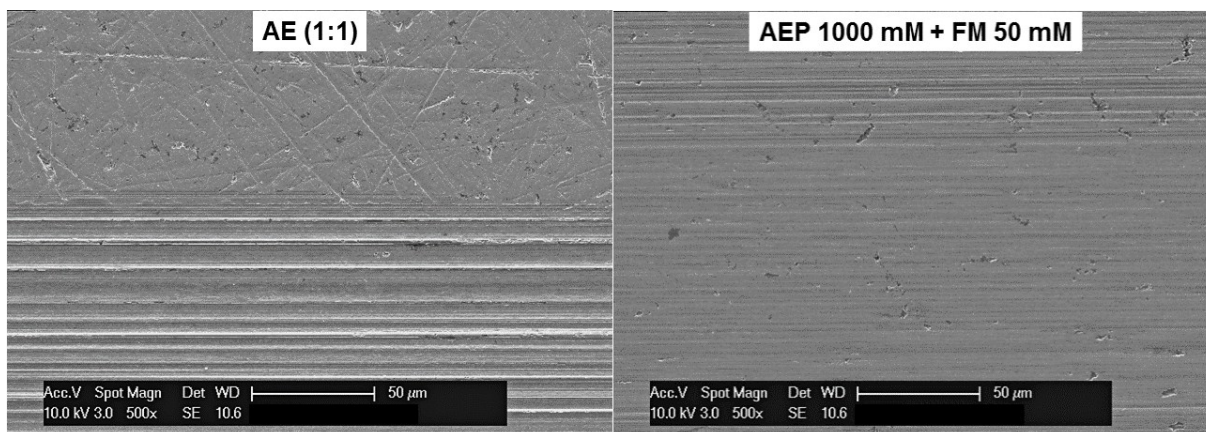


Figure S7. SEM micrographs of the discs lubricated with AE (1:1) and AEP 1000 mM + FM 50 mM

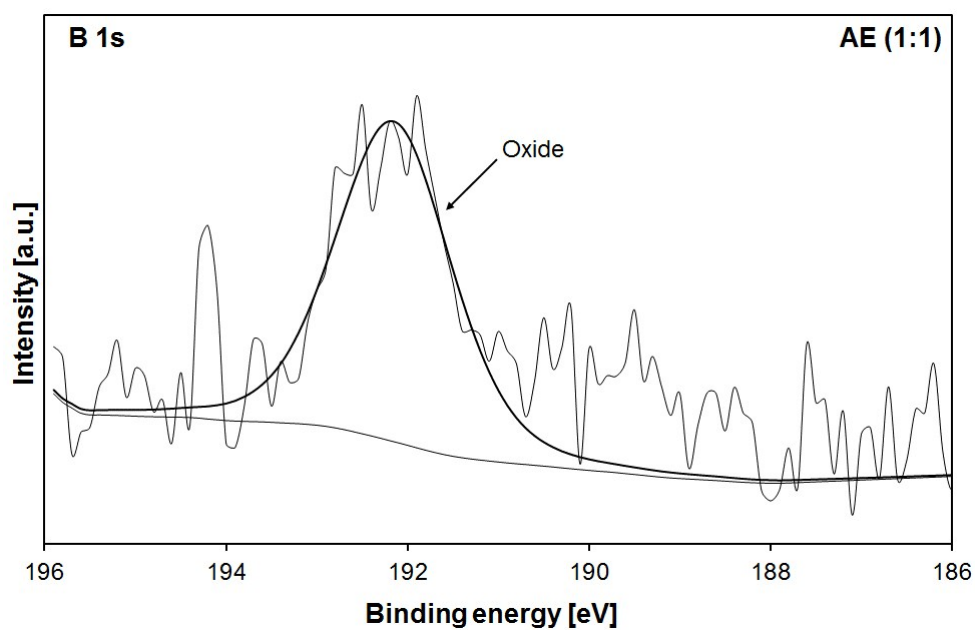


Figure S8. High resolution XPS spectrum of B 1s from the AE (1:1) mixture showing the appearance of boron oxide inside the wear scar generated on the steel disc