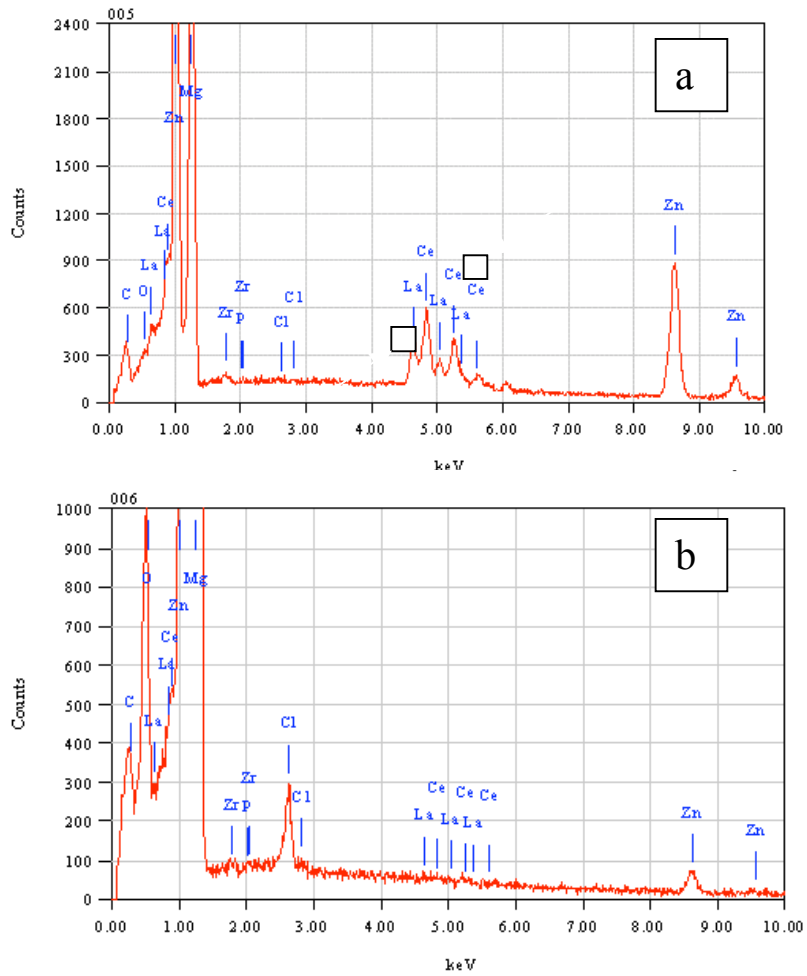


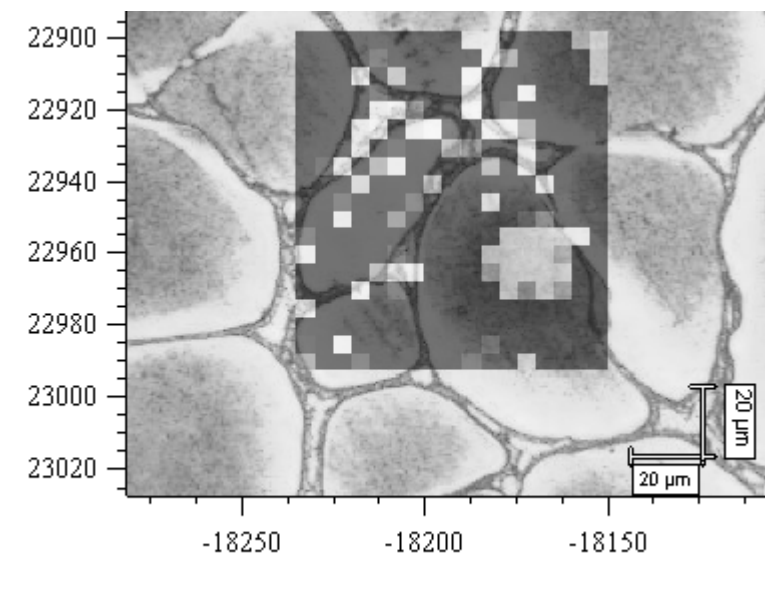
Supplementary Information

New insights into the fundamental chemical nature of ionic liquid film formation on magnesium alloy surfaces

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S1: SEM EDX analyses from manuscript Figure 3 for (a) the intermetallic region and (b) neighbouring the grain boundary, which suggest that there is more IL interaction away from the grain boundary areas.



S2: Raman map of ZE41 surface with a 48hr dpp treatment. Light coloured regions are where the peak at 1280 cm^{-1} , which is indicative of where the phosphate group, is not present.

S3. ^{19}F Magic Angle Spinning NMR for pure IL, IL on Al_2O_3 surface, IL on $\text{Mg}(\text{OH})_2$ surface for the phosphonium bis(trifluoromethyl sulfonamide) IL.

