IONS AT THE SURFACE OF A ROOM-TEMPERATURE IONIC LIQUID

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The orientation and interfacial location of both the cation and anion of the ionic liquids, 1-butyl-3-methylimidazolium methylsulfate, [BMIM][MS] and 1-butyl-3-methylimidazolium methylsulfonate, [BMIM][CH_3SO_3], have been determined by sum-frequency generation vibrational spectroscopy and X-ray crystallography. The results indicate that both the cation and anion occupy the first layer at the gas-liquid interface. Further, the methyl groups of the cation and anion are directed away from the liquid phase into the gas phase.