# Salt Ionic Crystal Packing: Deconvoluting the Factors that Make Ionic Liquids Liquid

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Ionic liquids are a rapidly expanding field of research, yet the factors which govern a salt's thermal properties remain poorly understood. To determine how ion crystal packing influences the thermal properties of salts, thirty six salts with organic cations and $N(SO_2CF_3)_2^-$ ($TFSI^-$), $N(SO_2C_2F_5)_2^-$ ($BETI^-$) and $N(SO_2CF_3)(SO_2C_4F_9)^-$ ($FMBSI^-$) anions have been synthesized and thermally characterized by DSC and XRD. Crystal structures for a number of the salts with $TFSI^-$, $BETI^-$ and $FMBSI^-$ anions have been determined and are reported.