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Determination of Volatility of Ionic Liquids at the Nanoscale by means of Ultra-Fast Scanning Calorimetry – the Method MATHIAS AHRENBERG, Institute of Physics, University of Rostock, Germany, MARTIN BECK, Faculty of Mechanical Engineering, University of Rostock, Germany, CHRISTIN SCHMIDT, SERGEY P. VEREVKIN, Institute of Chemistry, University of Rostock, Germany, OLAF KESSLER, Faculty of Mechanical Engineering, University of Rostock, Germany, UDO KRAGL, Institute of Chemistry, University of Rostock, Germany, CHRISTOPH SCHICK, Institute of Physics, University of Rostock, Germany — We present a new method for the determination of the vapour pressure of low volatile compounds using differential fast scanning calorimetry. We have developed and proven this method using the ionic liquids [EMIm][NTf_2] and [EMIm][NO_3] at temperatures up to 750 K and in different atmospheres to distinguish between decomposition and evaporation[1]. It was demonstrated that evaporation is still the dominating process of mass loss even at temperatures 100 K above the onset of decomposition as measured with common techniques, e.g TGA. Since the method allows very high heating rates (up to 10^6 K/s)[2], much higher temperatures can be reached in the measurement of the vapour pressure as compared to common devices without significant decomposition of the ionic liquid. Furthermore, this method represents an improvement of the boiling point estimation of ILs due to the large accessible temperature range of mass loss rate determination. 1. M. Ahrenberg et al., Physical Chemistry Chemical Physics, 2014, 16, 2971-2980. 2. E. Zhuravlev and C. Schick, Thermochim. Acta, 2010, 505, 1-13.

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