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## FIRST APPLICATION OF SIMULTANEOUS SANS AND DIFFERENTIAL SCANNING CALORIMETRY: MICROPHASE SEPARATED ALKANE BLENDS

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The combination of small-angle x-ray scattering experiments with simultaneous measurement of phase transitions using differential scanning calorimetry (DSC) has become common-place. However, no such facility existed, until recently to enable the simultaneous measurement of DSC and small angle neutron scattering (SANS). DSC data complements SANS by providing first and second order phase transition temperatures and, with appropriate calibration, the magnitude and sign of associated enthalpy changes due to these phase transitions. A range of challenges have been addressed to enable the collection of simultaneous SANS and DSC data associated not only with intrinsic flux limitations but also scattering geometry, thermal control and synchronisation of the DSC and SANS data. The development of a DSC suitable for SANS is detailed here which, to our knowledge, is the first and only one of its kind. The resulting instrument has a temperature range of -50°C to 500°C and a furnace geometry that allows access to the full  $q$  range of QUOKKA, at the OPAL reactor to be reached. The DSC-SANS was first used to investigate the behaviour of binary mixtures of normal alkanes which is presented here although several further successful experiments have been carried out since on range of soft and hard condensed matter samples.