120g Diffusities of N-Alkanes in Silicalite Using the Zlc Method

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For the design of adsorption and membrane based separation processes, it is important to be able to measure mass transfer kinetics in nanoporous solids. A better understanding of this phenomenon, will aid the development of advanced models for industrial applications of these materials. A number of different experimental techniques are currently available for determining diffusivities in zeolites. There is however no reliable theory that can easily predict the diffusivity for different components in different adsorbents, as it is often hard to relate these values to the underlying microscopic mechanisms. Furthermore, for few sorbate-zeolite systems, large discrepancies exist between values obtained from different experimental techniques. To resolve these issues and to generate a database of reliable experimental results a collaborative effort involving internationally leading groups form France, Germany and the UK is underway. At UCL, we are applying the Zero-Length Column (ZLC) technique to determine the intracrystalline diffusivity values for a wide range of sorbate/zeolite systems. ZLC results of n-alkanes (C6-C14) in silicalite will be reported. A comparison with the results on the same samples obtained using the PFG-NMR and QENS techniques will be presented.