

THE ADSORPTION OF NITROGEN OXIDES ON ICE – FINAL RESULTS OF THE THERMO-CHROMATOGRAPHY EXPERIMENTS

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Thermo-chromatography is a gas – solid chromatography method, well suited to analyse the adsorption properties of gases on various surfaces, such as metals or even ice. In principle, ^{13}N labelled nitrogen oxides are fed to a column filled with ice spheres to which a strong temperature gradient of -8 K per centimeter is established. The temperature gradient leads to an enhanced retention of the species as they are transported along the column. After a certain time the migration distance of each species in the column is determined. Based on the migration distance and the assumption of adsorption being the determining step in retention, a standard adsorption enthalpy is calculated. We will show that this assumption is valid even for the system of nitrogen oxides, e.g. that the retention is not influenced by dimerisation, partitioning into a quasi-liquid layer or migration into the grain boundaries or bulk; but solely due to adsorption. In addition, the standard adsorption enthalpies for NO, NO₂, HONO, HNO₃ and PAN on ice are given as well as an estimate of the partition coefficient under environmental conditions.