



Laboratory studies of the photochemical decomposition of acetaldehyde trapped in ice

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The uptake and incorporation of atmospheric trace gases in water ice, their interactions and chemical reactions with water molecules are very important for the understanding of processes at the air/ice interface. Reactive trace gases trapped in ice may be subject of photochemical reactions when irradiated with solar UV radiation. In our contribution we will present results of our recent UV photolysis studies of acetaldehyde (CH_3CHO) trapped in water ice and for comparison the results obtained for isolated CH_3CHO in solid rare gas (Ne, Ar, Kr, Xe) matrices. Acetaldehyde (CH_3CHO) is an atmospheric trace gas which is abundant in the upper troposphere with mixing ratios in the order of 30 – 100 pptv. One possible sink for CH_3CHO is adsorption on cirrus cloud ice particles followed by photochemical destruction. Similar processes will take place also at snow and ice covered surfaces at the ground. Whereas in rare gas matrices the two major products we have observed in our after UV photolysis experiments are CO and CH_4 we find that in water ice CO_2 is the major product apart from small amounts of CO and CH_4 .