Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

On the Control of Product Yields in the Photofragmentation of Deuteriumchlorid Ions (DCl^+) – Cl + D^+ < - - DCl^+ - - > Cl^+ + D.[1] KARL-MICHAEL WEITZEL, GEORG BREUNIG, ALEXANDRA LAUER, Philipps Universitaet Marburg, FB Chemie, Germany, MIKHAIL KOROLKOV, Academy of Science, Minsk, Belarus — We have investigated the prospect of controlling the photofragmentation of deuterium chloride ions (DCl^+) via ultra short IR laser pulses both by experiments and by numerical solution of coupled Schrödinger equations. The calculations provide evidence that the ratio of product ion yields Cl^+ versus D^+ can be manipulated by appropriate choice of laser pulse parameters, in particular central laser wavelength, pulse duration, intensity and chirp [1]. The analysis of time dependent populations reveals phase sensitive competition between intra- and inter-electronic state excitation. Complementary, we have performed one- and two-color fs experiments looking at the dissociation of DCl^+ ions at 800 nm [2] and in the range from 3.5μm to 7.5μm (2857cm^{-1} to 1333cm^{-1}) [3]. In particular we show, that the ratio of product yields D^+/Cl^+ can be controlled via the chirp of the laser pulse at 4.5μm. References [1] M.V. Korolkov, K.-M. Weitzel, J. Chem. Phys. 123, 164308, (2005) [2] H.G. Breunig, A. Lauer, K.-M. Weitzel, Proceedings of the Femtochemistry VII (2005) [3] H.G. Breunig, K.-M. Weitzel, in preparation.

[1]Supported by INTAS and the DFG.

Karl-Michael Weitzel
Philipps Universitaet Marburg, FB Chemie

Date submitted: 04 Dec 2005 Electronic form version 1.4