Toward the formation of the peptide bond in interstellar ices M. Förstel[1] and P. Maksyutenko[1] and R. I. Kaiser[1], [1]UH Manoa, W. M. Keck Research Laboratory in Astrochemistry, Department of Chemistry, Bilger 304, 2545 McCarthy Mall, Honolulu, HI 96822-2275.

Introduction: The peptide bond is a fundamental building block of life on earth as we know it[1]. Dipeptides are important carriers of the peptide bond and are not only building blocks of proteins but may have played an important role in prebiotic evolution. As catalysers they can support the formation of sugars, longer peptides or even enzymes[1-3]. Here we report on experiments aimed to understand the complex chemistry of interstellar ices under the influence of ionizing radiation. In detail we report on the formation and detection of urea and formamide after irradiation of NH_3/CO ice with energetic electrons. [4]

Figure one shows temperature programmed desorption data obtained after irradiating amorphous NH_3/CO ice with electrons with a kinetic energy of 5keV. Molecules which desorb into the gas phase are ionized using 10.5eVphotons. The ions are then detected in a reflectron time of flight mass spectrometer.

We observe a large variety of masses up to 88u. In the talk we will discuss the possible molecules which formed and how this formation could have taken place. We will concentrate on the signal at mass-to-charge of 60 which we could identify as stemming from urea. This is the first time that urea could be observed *in situ*. That is, desorbing into the gas phase from irradiated ice. Earlier experiments were able to only tentatively assign urea after chromatographic analyzation of the residues of the ice at room temperature[5,6].

References:

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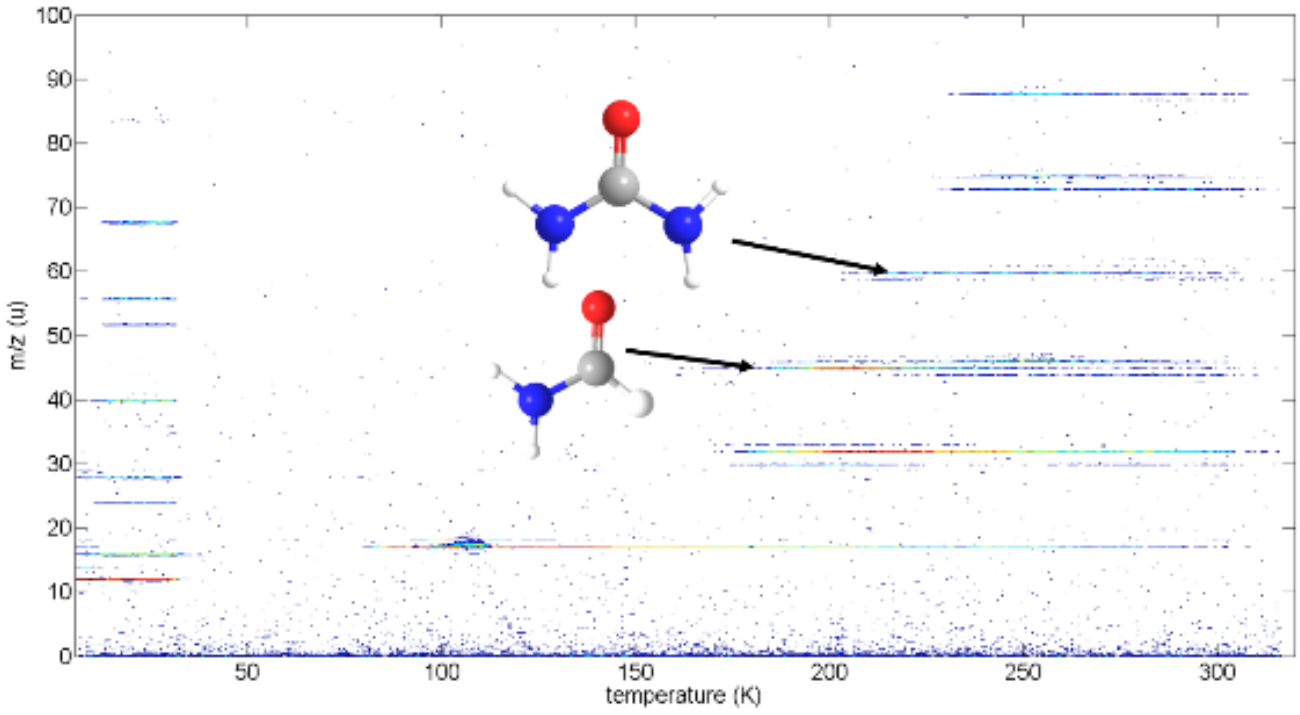

Figure 1: Temperature programmed desorption data after irradiating a mixture of amorphous NH_3/CO ice with energetic electrons. Highlighted are the mass to charge ratios of urea and formamide.