

**STUDY OF THE INTERSTELLAR NEUTRAL CCCN FORMED FROM  
[CCCN]<sup>-</sup> IN A COLLISION CELL OF A ZAB 2HF MASS SPECTROMETER. A JOINT  
EXPERIMENTAL AND THEORETICAL STUDY.**

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We have studied the reactivity of the transient molecules CCCC,<sup>1</sup> CCCO<sup>2</sup> and CCCS<sup>2</sup> that have been detected in interstellar dust clouds. Energised CCCC undergoes carbon scrambling through a rhombic form, whereas CCCO and CCCS, under the same experimental conditions decompose by losses of CO and CS respectively. CCCN has also been detected in interstellar clouds<sup>3</sup> and it is possible that this species may be implicated in the formation of simple amino acids and perhaps the pyrimidine and purine building blocks of DNA. We have prepared this neutral in a collision cell of a ZAB 2HF mass spectrometer by charge stripping of [CCCN]<sup>-</sup> (formed by the reaction  $\text{CH}_2^= \text{CCN} \rightarrow [\text{H}^+ (\text{HCCCN})] \rightarrow [\text{CCCN}]^- + \text{H}_2$ ). A combined experimental and theoretical investigation of energised CCCN indicates that it may rearrange to CCNC and also decompose by loss of C.

1 S.J.Blanksby, D.Schröder, S.Dua, J.H.Bowie and H.Schwarz. *J. Am. Chem. Soc.*, 2000, **122**, 7105-7113.

2 K.M.Tran, A.M.McAnoy and J.H.Bowie, *Org. Biomol. Chem.*, 2004, **2**, 999-1006.

3 <http://www.cv.nrao.edu/~awootten/allmols.html>