Thermochimica Acta, 83 (1985) 397–398
Elsevier Science Publishers B.V., Amsterdam – Printed in The Netherlands

Addendum

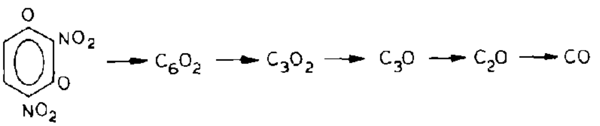
TRICARBON MONOXIDE AND DICARBON MONOXIDE: ADDENDUM TO "DECOMPOSITION OF LEAD(II) 2,4-DINITRORESORCINATE"

T.B. TANG *

Division of Solid-State Chemistry, Institute for Molecular Science, Okazaki 444 (Japan)

(Received 13 August 1984)

In a recent paper [1], the following intermittent pathway for the thermal decomposition of the dinitroresorcinate moiety in the solid state was suggested



where arrows mean "give rise to". The last four species in the scheme are in the gaseous state, as peaks of corresponding masses have been found in continuously recorded, time-resolved mass spectra. C_3O_2, carbon suboxide, has long been known to exist. For C_3O and C_2O, with the use of mass spectrometry, it could not be determined if one or both of them appear in the form of metastable molecules, or are produced through fragmentation processes in the electron beam of the spectrometer, in which case the ionic form is probable.

Subsequently, it was learnt that the existence of C_3O molecules has been conclusively demonstrated with mass spectrometry and microwave spectroscopy [2]. Moreover, C_3O was detected in a dark gas cloud in space, becoming the first known interstellar carbon-chain molecule to contain oxygen [3]. The microwave spectrum of the C_2O radical has also been studied [4], the motivation deriving from the prediction that both neutral and ionised C_2O are present in space [5].

The results from ref. 1 suggest that C_3O may produce C_2O either through thermal collision or electron impact. It would be useful to determine the cross-section for the reaction of a C_3O molecule with a free electron to produce a C_2O molecule. The coupling of the concentrations of C_3O and of

* Permanent address: Science Faculty, Hong Kong Baptist College, Waterloo Road, Kowloon, Hong Kong.

0040-6031/85/$03.30

C_2O via this reaction will have to be considered in a model for the chemical evolution of cold interstellar gas clouds.

Related experiments have indicated the generation of C_3O and C_2O in a DC glow discharge of carbon suboxide. The results will be reported later [6].

REFERENCES

1 T.B. Tang, Thermochim. Acta, 61 (1983) 341.
2 R.D. Brown, F.W. Eastwood, P.S. Elmes and P.D. Godfrey, J. Am. Chem. Soc., 105 (1983) 6496.
3 H.E. Matthews, W.M. Irvine, P. Friberg, R.D. Brown and P.D. Godfrey, Nature (London), 310 (1984) 125.
4 C. Yamada, S. Saito, H. Kanamori and E. Hirota, Astrophys. J., in press.
5 H. Suzuki, Prog. Theor. Phys., 62 (1979) 936.
6 T.B. Tang, H. Inokuchi, S. Saito, C. Yamada and E. Hirota, to be published.