

Structural and thermal studies of some polydiacetylenes

G. H. W. Milburn, A. Werninck, M. J. Barrow and A. Lough

Department of Applied Chemical Sciences, Napier College, Colinton Road,
Edinburgh EH10 5DT, UK

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Two crystal structures of symmetrical diacetylene molecules are reported as examples of extensive studies in this area.

(Keywords: diacetylenes; optoelectronics; structure; thermal studies)

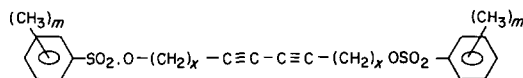
INTRODUCTION

An investigation into the synthesis and structural characteristics of di-substituted diacetylenes, both symmetrical and asymmetrical, has been on-going for a number of years by our group. Property-structure relationships have also been investigated in order to facilitate the synthesis of molecules having structures with desirable features.

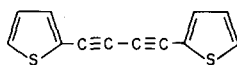
DISCUSSION

Modern studies in this field date from the work of Wegner on the solid state polymerization of diacetylene monomers¹. There have been extensive studies of such molecular systems since this time^{2,3}, and theoretical criteria for solid state reactivity³⁻⁶ have been established. Several different families of diacetylene monomers and polymers have been made and are undergoing structural analysis by X-ray diffraction methods⁷⁻⁹. Additionally, use has been made of thermal analysis methods to obtain further information on these structural systems¹⁰.

As an illustration of the investigations at present being carried out the crystal structures of some of the diacetylene systems (ref. 11):



and (ref. 12)



are reported.

The synthesis of symmetric and asymmetric diacetylene monomers of a variety of other systems have led to the formation of approximately 100 novel molecules which are at present undergoing investigation using thermal analysis and X-ray diffraction techniques, as well as being evaluated for their opto-electronic properties.

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