

C
547

ELECTROREDUCTION STUDIES ON CITRAL

A Thesis presented by

GAMINI KUMARASIRI MANUWEERA B.Sc.(Hons)

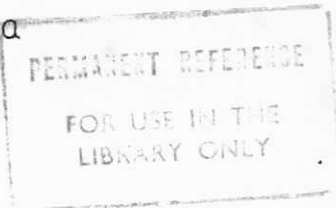
IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF

MASTER OF PHILOSOPHY

of

University of Peradeniya

Sri Lanka



AUGUST 1983

RESEARCH LABORATORY
DEPARTMENT OF CHEMISTRY

3670506

ABSTRACT

The electrochemical reduction of citral was investigated in aqueous as well as non-aqueous media, both in homogeneous solutions and in emulsion. Polarography of citral gave a single wave over the pH range of 2 to 12. Further the wave showed that the process is a quasi-reversible one-electron reaction. The large scale electrolysis of citral in homogeneous solution gave a hydrodimer as the major product with almost all aqueous systems. The formation of this hydrodimer was proved by the use of cyclic voltammetry and chronoamperometry to proceed through a 'DISP' pathway.

In addition to this, citral was reduced on some solid electrodes. The reduction on solid electrode depended on the nature of the electrolyte too.

An additional compound was isolated from the reduction product of citral. This compound is thought to be derived from the hydrodimer.

In aqueous emulsion, citral gave geraniol on reduction. The yield of the geraniol was 52% with the system of Li-p-toluenesulphonate.

The emulsion technique was employed with some other salts such as borax, but good yields could not be obtained.