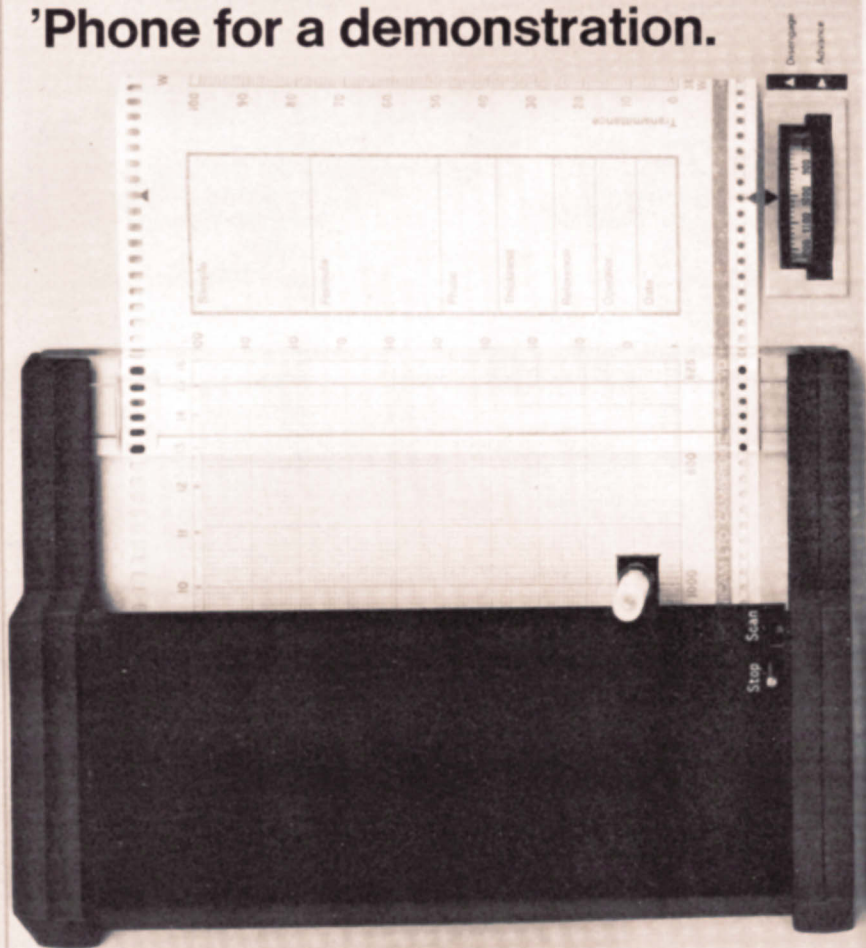


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Summaries of Papers in this Issue

Mass and Charge Transfer Kinetics and Coulometric Current Efficiencies

Part III. Pattern Theory and its Application to Oxidation - Reduction Electrode Processes

Electrode processes are divided into three classes on the basis of the speed of the charge-transfer process: fast, which are fully described by mass-transfer theory; moderate, which require the complete rigorous mass *plus* charge-transfer theory; and slow, which can be treated rigorously by a simplified theory. This simplified theory is developed into pattern theory, from which pattern equations are derived that are explicitly descriptive of the behaviour pattern of slow reactions and demonstrate the involvement of mass-transfer processes therein. From pattern theory, methods based upon voltammetric scans are developed for the rapid experimental determination of k and α when the conditional potential and limiting current are measurable and also when either or both are unknown. These methods are applicable *in situ* during a coulometric determination, and current efficiencies can be evaluated from the values obtained. Calculated and experimental scans and efficiencies show excellent agreement.

E. BISHOP

Chemistry Department, University of Exeter, Stocker Road, Exeter, Devon, EX4 4QD.

Analyst, 1972, **97**, 761-771.

Mass and Charge Transfer Kinetics and Coulometric Current Efficiencies

Part IV. The Application of Pattern Theory to Solvent-molecule and Solvent-ion Reactions and the Evaluation of Current Efficiencies

The previously developed pattern theory has been applied to background reactions of the solvent and its ions, with water used as the example. Pattern and behaviour equations are developed and discussed, and methods are described for the rapid *in situ* determination of charge-transfer coefficients and conditional rate constants when a limiting current is known and when it is not, for the reduction of hydrogen ions and water molecules and for the oxidation of hydroxyl ions and water molecules. The voltammetric behaviour of these reactions is rationalised and the determination of coulometric current efficiencies and regulation of conditions to attain the best current efficiency are discussed.

E. BISHOP

Chemistry Department, University of Exeter, Stocker Road, Exeter, Devon, EX4 4QD.

Analyst, 1972, **97**, 772-782.

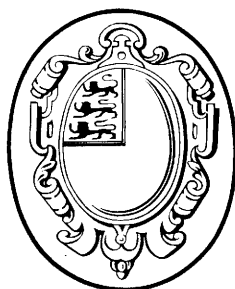
Thermometric Determination of Acid Anhydrides in the Presence of the Parent Acids

A thermometric method is described for the determination of some carboxylic acid anhydrides. The anhydride is added to a methanolic solution of morpholine and the unreacted morpholine is titrated with a methanolic solution of hydrochloric acid. In most instances, the presence of large amounts of the parent acid has no effect on the determination and for 0.5 mmol of anhydride the accuracy is about ± 1 per cent.

L. S. BARK and P. BATE

Department of Chemistry and Applied Chemistry, University of Salford, Salford, Lancashire, M5 4WT.

Analyst, 1972, **97**, 783-786.



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