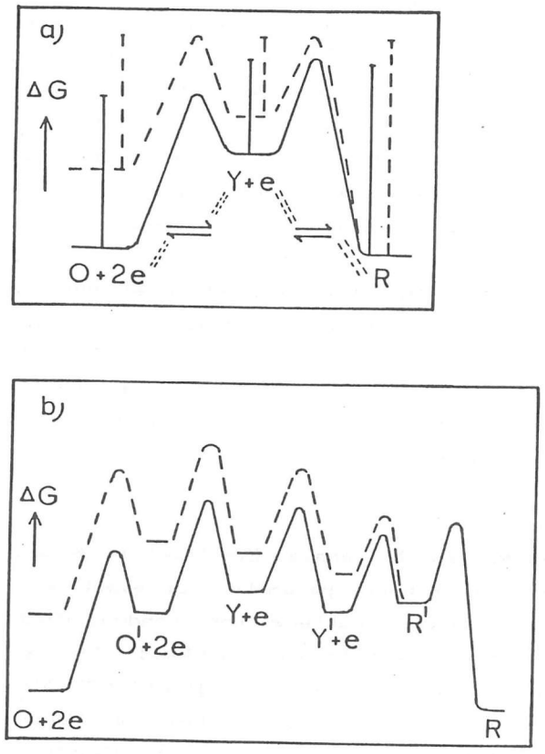

Fig. 1 Schematic representation of energy vs reaction coordinate for (a) an EE mechanism, (b) a CECEC mechanism, ——— at the standard potential E^o, - - - - - - at $E < E^o$.

Summary of Lecture to be Presented at the October 1987 Meeting of the Portugese Electrochemical Society in Faro

MEMBRANE ELECTRODES OF HERBICIDAL AND PHARMACEUTICAL INTEREST

J.D.R.Thomas

Applied Chemistry Department, Redwood Building, UWIST, PO Box 13, Cardiff CF1 3XF, Wales, United Kingdom

PVC-liquid membrane electrodes based on crown ethers will be described for diquat, paraquat and guanidinium. The crown ether systems for diquat and paraquat[1,2] consist of dibenzo-30-crown-10 (DB30C10), bis-metaphenylene-32-crown-10 (BMP32C10), bis-metaphenylene-38-crown-12 (BMP38C12), bis-paraphenylene-34-crown-10 (BPP34C10), bis-paraphenylene-37-crown-11 (BPP37C11), and dinaphthalene-36-crown-10 (DN36C10). The data will be discussed in terms of quality of potentiometric response related to conformational phenomena of the crown ethers in their complexation with the two dications and with the related 4,4'-dipyridyl.

The crown ether system for guanidinium consists[3] of dibenzo-27-crown-9. Here, as indeed with the diquat and paraquat electrodes, the optimization of solvent mediator in relation to general electrode properties and selectivity of response will be discussed.

Finally, electrodes for diquat, paraquat and 4,4'-dipyridinium based on charged or ionized complexing agents (hexafluorophosphate, anthraquinone-2-sulphonate, octylsulphate, picrate, dipicrylaminate, diamine Green B, tetraphenylborate and terakis-4-chlorophenylborate) will be discussed in relation to the analogy between ion-pair extraction and ion-selective electrode function and selectivity.[4] Some mention will be made of the charge transfer from the tetraphenylborate anion to the dications in relation to the associated electrode response.[5]

References

1. G.J.Moody, R.K.Owusu and J.D.R.Thomas, Analyst, 1987, 112, 121.
2. G.J.Moody, R.K.Owusu and J.D.R.Thomas, ibid., in the press.
3. F.N.Assubaie, G.J.Moody and J.D.R.Thomas, ibid., in the press.
4. G.J.Moody, R.K.Owusu and J.D.R.Thomas, ibid., in the press.
5. G.J.Moody, R.K.Owusu, A.M.Z.Slawin, N.Spencer, J.F.Stoddart, J.D.R.Thomas and D.J.Williams, Angewandte Chemie, in the press.