resulting in the discharge reaction

$$(xy)M + (CH)_x \rightarrow [M_y^+(CH^{-y})]_x \qquad (11)$$

These cells show good discharge plateaus, power densities, recyclability and excellent retention of charge both in the charged and partly discharged states.

The cells employing a Li anode naturally exhibit a greater power density than those employing sodium, but even so their energy density is only moderate when they are discharged to a value of $y \sim 0.1$ in the above electrolyte. However, in view of the recent announcement by Allied Corporation, mentioned in the previous section, where values of $y \sim 0.18$ can be obtained by use of an electrolyte consisting of $Li^+(BR_4)^-$ in THF, it appears that the energy density of these types of cells could probably be increased to a value which could have real technological significance.

(3) Use of Forms of Polyaniline as Electrode Active Materials. (See reprint: 24).

Towards the termination of this contract, preliminary studies supported in part by the contract, were performed on the use of the emeraldine form of polyaniline as an electrode-active material in rechargeable cells employing a zinc anode and a polyaniline cathode in an aqueous electrolyte. The cell showed many desirable features such as excellent recyclability, coulombic efficiency and retention of charge. The gravimetric energy density was ~ 62% that of a Ni/Cd cell; however, the volumetric energy is probably not sufficiently large for this type of battery to be useful technologically.

Continuing studies, commenced after termination of this contract, have involved a Li/polyaniline cell using a propylene carbonate/$LiClO_4$ electrolyte. The preliminary results suggest this may be the best rechargeable battery to date involving a conducting polymer as an electrode-active material.

(4) Present Status of Rechargeable Batteries Employing Polymer Electrodes

Since the commercial development of a successful battery often takes more than