(where M^+ is Li^+ or Na^+) have been carried out, many of them in a battery mode of charging and discharging, in order to evaluate the polymer in its various forms as potential anode-active or cathode-active materials in novel rechargeable batteries. Very preliminary studies were also performed on the study of fundamental properties of polyaniline with a view to its possible use as an electrode-active material (Reprints: 2, 6, 7, 8, 9, 11, 13, 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27).

Patents on the possible use of polyacetylene in its various forms as an electrode-active material in novel rechargeable batteries has been filed previously on behalf of the University of Pennsylvania. These were based on studies performed by the present principal investigator either alone (together with appropriate students) or in collaboration with a previous co-principal investigator, Professor A. J. Heeger. Work under this contract has involved detailed electrochemical studies, based on our previous discoveries, with a view to providing sufficient data to permit industry to make a decision whether or not to launch a program of their own to evaluate the possible commercial application of polyacetylene and conducting polymers in general, as electrode-active materials in rechargeable batteries. The success of the project is evidenced, at least in part, by the announcement that Allied Corporation, which holds the University's exclusive patent rights in this field for North America and Japan had entered into an agreement with the Japanese Companies, Showa Denko K. K. and Hitachi Ltd. for research and development of rechargeable polymer batteries. Similarly, the West German Companies, B.A.S.F. AG. and Varta Batterie have announced a collaborative R. and D. program on polymer batteries. B.A.S.F. AG. holds the Univerisity's patent rights for Europe.

(1) <u>Study of Chief Characteristic Chemical and Physical Properties of Polyacetylene and other Conducting Polymers.</u> (Reprints: 1, 3, 4, 5, 10, 14, 16, 23).

These studies showed that $(CH)_x$ could be reversibly p-doped (oxidized) electrochemically in the form of thin films. The doping and undoping was followed by a