of an aromatic/non-carbon alternating backbone. These types of polymers are excellent models for continued study in order to understand the chemistry and physics of conducting polymers in general.

The overall immediate objective of the research proposed below is to attempt to gain a basic understanding of the interrelationship between the chemistry, structure and morphology of each of the above types of polymers (in their doped and undoped forms), and their electronic and magnetic properties. Such an understanding is essential in attaining the ultimate objective of synthesizing conducting polymers, not necessarily just those or derivatives of those studied in this group, which (i) are processable and environmentally and thermally stable under desired, preselected sets of conditions, (ii) have appropriate mechanical properties and (iii) can be fabricated to exhibit preselected conductivites ranging from the semiconducting regime of approximately 10^{-7} S/cm to that of copper (approximately 10^{6}S/cm). In this respect it might be noted that polymers conducting in the potentially technologically important range ~ 10^{-2} to 10^{-7} S/cm have been generally neglected in conducting polymer studies. This study group concentrated on the following general research areas, all of which are closely interrelated.

(1) Synthetic Control of Chemical Composition, Structure and Morphology of the Doped and Non-Doped Polymers.

(2) Doping Mechanism and the Effect of Dopant Ion on Chemical, Electronic and Mechanical Properties.

(3) Degradation Mechanism of the Doped Polymers.

(4) Processability of, and Composites Containing, Conducting Polymers.

In some instances a given specific research topic could have been equally well incorporated into more than one of these general research areas. No attempt has been made to prioritize these four general areas since it is essential that research continue simultaneously in all areas if the field is to develop with maximum efficiency.