INTRODUCTION

The field of conducting polymers owes its growth to the strong interdisciplinary interactions between chemist and physicist and the development of an appropriate theoretical framework to guide system design. As a consequence, a target system for synthesis should be chosen keeping in mind the following criteria.

(1) A system should be chosen in which there is a theoretically valid reason for anticipating conductive properties, e.g. band structure calculation, strong orbital overlap, etc.

(2) The choice should reflect an awareness of potential applications for polymeric conductors.

(3) Systems which would assist in evaluating a theoretical prediction should be targets irrespective of their anticipated physical and chemical properties.

(4) Stability (chemical, thermal) and processibility (solution, melt) are important design considerations.

(5) Direct preparation of polymers in macroscopically ordered forms via appropiate techniques, e.g. electropolymerization, topochemical polymerization, should be attempted.

(6) The potential of the system for structural modulation via facile synthetic routes should be evaluated.

(7) The conversion of conventional polymers which are already stable and processible into conductive systems, and/or copolymerization, blending or doping of new systems with such conventional polymers is an important area for investigation.

(8) Conductivity is achieved in many systems by doping -- the development of novel dopants or doping procedures is of considerable interest.

Keeping in mind these criteria, we now give a specific discussion of five important materials areas where synthetic efforts need to be focussed.