microscopy. Expanded use of synchrotron radiation for the characterization of small crystals is encouraged. In situ measurements of structural evolution during doping are feasible for certain of these methods and should be pursued.

(2) Increased theoretical effort to model polymer molecular, crystallogrophic, and defect structures and to compare these model calculations with observables is important - a major problem being the treatment of electrostatic interactions.

(3) Increased effort on using spectrocopic methods (Raman, IR, Solid State C_{13}, UPS) to characterize structural irregularities, chain conjugation length, and the distribution of conjugation lengths is also suggested. Laser desorption/Fourier transform mass spectral analysis of the chemical compositions of doped and undoped polymers should be encouraged. Infrared and neutron scattering spectroscopy coupled with normal mode analysis on polymers such as polyaniline could produce important results. Techniques for characterization of interfacial structures and structural orientation should be developed.

1.2 DEVELOPMENT OF NEARLY DEFECT-FREE CONDUCTING POLYMER COMPLEXES AND EXPERIMENTAL MODEL COMPOUNDS

Scope

Develop an improved understanding of structure-properly relationships for nearly defect-free conducting polymers via (1) work on model compounds of low molecular weight; (2) development of improved materials synthesis and molecular processing techniques, so as to obtain high molecular weight materials with improved