

to ascertain how and why the polymer degrades. Only then will it be possible to scientifically build stability into the polymer. It seems not unlikely that larger more polarizable dopant ions will permit distribution of the counter positive or negative charge on the polymer backbone over a larger length of the polymer chain, thus reducing the ease of nucleophilic or electrophilic attack of the polymer backbone with resulting decrease in its chemical reactivity either to its own dopant ion during thermal decomposition or to attack by an external species. Solvation of the ion might also lead to similar stabilizing effects.

Status

At the present time very little effort has been expended on this subject. It is one of the most neglected areas in the conducting polymer field.

Research Proposed

(i) Kinetic decomposition studies should be performed on the title compounds (combined with monomeric dopant ions) when heated in vacuo, when exposed to U/V, oxygen, water etc. in order to determine the rate-controlling factor in their decomposition. Analogous studies should then be performed on the same material combined with polymeric, etc. dopant ions.

(ii) A comparison should be made with corresponding studies conducted on e.g. polypyrrole, polythiophene, etc. in order to ascertain why one class of polymer is more stable than others under a given set of experimental conditions.

1.4. Processibility of, and Composites Containing, Conducting Polymers

Scope

Most conventional organic polymers, in order to be technologically useful, must be compounded or blended, co-polymerized with other polymers, controllably cross-linked or mixed with anti-oxidants or U/V stabilizers, etc. The same processing presumably also applies to conducting polymers.