IR SPECTRUM OF POLYSTYRENE

(Last Revision: January 31, 1997)

- ABSTRACT:

  A source of polystyrene foam is dissolved in a solvent and then cast on a glass plate. The resulting film is mounted on cardboard and an IR spectrum recorded. The recorded spectrum is then compared to a library spectrum.

- OTHER REFERENCES:

  Atkins, "Physical Chemistry", 5th edition, 1994. Chapter 16

- GENERAL DESCRIPTION AND THEORY:

  Polystyrene is readily soluble in a number of common solvents and can easily be cast as a film by pouring the polymer solution onto a glass plate and letting the solvent evaporate. Polystyrene films give a very good IR spectrum, which is often used as a standard.

- EQUIPMENT:

  The equipment used for this experiment includes beakers, test tubes, glass plate,and a Fourier Transform IR Spectrometer

- CHEMICALS:

  Polystyrene foam, toluene or acetone are used in the experiment.

- DIAGRAMS:
- LABORATORY PROCEDURE:

  About a gram of polystyrene should be broken into small pieces and placed into a test tube or beaker. Then enough solvent should be added to prepare about a 20% solution (use about 4 to 5 ml). The mixture should be stirred until the polymer is completely dissolved.

  The film is cast by pouring the viscous solution near the edge of a glass plate. It may be spread out and smoothed with a single pass of a knife (one pass only). Allow the film to dry slowly; it may take an hour or so.

  The film is removed by applying pressure with a spatula or razor blade at edges of the film. Then mount the film in a cardboard holder and place in the IR instrument.

  A spectrum should be taken of the film and spectral library used to identify the components in the film.

- CALCULATIONS:

  As directed in the laboratory.

- LITERATURE VALUES:

  Standard spectra are included in the spectral library which is accessed through the computer attached to the spectrometer.