

A Spectroscopic Analysis of the Crystalline and Amorphous  
Phases in a Vinylidene Fluoride/Trifluoroethylene Copolymer.

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The structure of a random copolymer of 75 mole% vinylidene fluoride and 25 mole% trifluoroethylene has been studied by infrared spectroscopy. Spectra of samples containing varying degree of crystallinity have been analyzed by factor analysis, and from this the spectra of pure amorphous and pure crystal phases have been isolated. The amount of the crystalline phase was determined as a function of annealing temperature, and a significant increase was found for annealing near the Curie transition temperature. We have also analyzed spectra obtained at varying temperature, and the spectra of the isolated low temperature and high temperature phases were obtained. The low temperature phase spectra appeared very similar to that of the isolated crystalline phase. The high temperature phase spectra differed from that of the amorphous, showing fewer sequences of four or more trans isomers and a greater amount of tg or tg' isomers. The low temperature phase content during a heating/cooling cycle was also analyzed.