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**THERMAL DEGRADATION BEHAVIOR OF A NEARLY ALTERNATING COPOLYMER OF VINYLIDENE  
CYANIDE WITH 2,2,2-TRIFLUOROETHYL METHACRYLATE**

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The thermal stability and degradation mechanism and kinetics of poly(VCN-co-MATRIF) were investigated in this study. Incorporation of MATRIF in the copolymer improved significantly the copolymer thermal stability with respect to both homopolymers; in particular, the incipient cleavage of side chains observed in the MATRIF homopolymers is effectively suppressed, possibly as a result of the predominantly alternating copolymer structure. The TG curve for poly(VCN-co- MATRIF) shows two degradation steps: the main one with onset at 368 °C results in nearly complete volatilization of the copolymer; a minor weight loss with onset at 222 °C is ascribed to impurities or low oligomers containing a high fraction of VCN dyads or other structural defects.

Pyrolysis GC-MS indicate depolymerization reaction as the principal degradation mechanism of both degradation steps. Thermal FT-IR and elemental analysis, the latter performed after annealing at 250°C, rule out elimination of HCN from VCN or ester side chain cleavage from MATRIF units as the cause of the low temperature weight loss.

The main kinetic parameters evaluated by isothermal (only for the main degradation step) and nonisothermal methods (Friedman, Flynn-Wall-Ozawa, and Kissinger, respectively) indicate a simple first order decomposition mechanism with dominant random scission depolymerization reaction.

The high activation energies (between 231 and 295 kJ/mol) determined according to the different procedures for the main degradation process are also consistent with a depolymerization mechanism involving the scission of main chain C-C bonds.