>>**Entry Name: Tetrafluoroethylene**
Synonym(s): Tetrafluoroethene, 9CI. Fluorocarbon 1114. TFE

CAS Registry Number: 116-14-3
$F_2C=CF_2$

Molecular Formula: C_2F_4
Molecular Weight: 100.016
Accurate Mass: 99.993612
Percentage Composition: C 24.02%; F 75.98%
Source/Synthesis: Manuf. by pyrolysis of Chlorodifluoromethane DLL34-T
Use/Importance: Used in manuf. of homo- and copolymers having valuable heat resistance, chemical inertness, electrical insulation and low friction props.
Physical Description: Gas
Melting Point: Fp –142.5°
Boiling Point: Bp –78.4°
Solubility: Insol. H_2O
Other Data: Q/e values for copolym., Q 0.032, e 1.63. Rates for radical polym., k_p 7400 L mol^{-1} s^{-1}, k_t 7.4 x 10^{-5} L mol^{-1} s^{-1} (50°). Forms copolymers with propylene:r_{C2F4} 0.05, r_{C3H6} 0.10; Q_{C2F4} 0.05; e_{C2F4} 1.22; Q_{C3H6} 0.02; e_{C3H6} -0.78 (peroxide redox catalysis): r_{C2F4} 0.06, r_{C3H6} 1.00 (γ-irradiation)
Hazard & Toxicity: Explodes under pressure, forms explosive peroxides, flammable, autoignition temp. 180/200°. LC_{50} (rat, ihl) 40000 ppm (4h exposure)

References:

Locke, E.G. *et al.*, *J.A.C.S.*, 1934, **56**, 1726, *(synth)*
Park, J.D. *et al.*, *Ind. Eng. Chem.*, 1947, **39**, 354, *(synth)*
Hudlický, M., *Chemistry of Organic Fluorine Compounds*, Pergamon, Oxford, 1961, *(rev)*
Tabata, Y. *et al.*, *J. Polym. Sci., Part A*, 1964, **2**, 2235-2243, *(copolym, γ-irradiation, reactivity ratios)*
Plyusnin, A.N. *et al.*, *Teor. Eksp. Khim.*, 1966, **2**, 777; *CA*, **66**, 95405k, *(polym, kinetics)*
Chait, E.M. *et al.*, *Org. Mass Spectrom.*, 1969, **2**, 1135, *(ms)*
Fogarasi, G., *Acta Chim. Hung.*, 1970, **66**, 87, *(ir)*
Venkateswarlu, Y. *et al.*, *Chem. Process. Eng. (Bombay)*, 1970, **4**, 25, *(rev)*
Fokin, A.V. *et al.*, *Zh. Fiz. Khim.*, 1973, **47**, 2688, *(F-19 nmr)*
Kojima, G. *et al.*, *Rubber Chem. Technol.*, 1977, **50**, 403-412; *CA*, **87**, 40460e, *(copolym)*
IARC Monog., 1979, **19**, 285; *Suppl*. 7, 72, *(rev, tox)*
Greenley, R.Z., *J. Macromol. Sci., Chem., Part A*, 1980, **14**, 427, *(Q/e values)*
Hunadi, R.J. *et al.*, *Synthesis*, 1982, 454, *(synth)*
Encyclopaedia of Polymer Science and Engineering, Wiley-Interscience, 2nd edn., 1989, **16**, 577, *(rev, polym)*
Kirk-Othmer Encycl. Chem. Technol., 4th edn., Wiley, 1991, **11**, 621; 644; 657; 671, *(rev)*
Luxon, S.G., *Hazards in the Chemical Laboratory, 5th edn., Royal Society of Chemistry*, 1992, 1191
Lewis, R.J., *Sax's Dangerous Properties of Industrial Materials, 8th edn., Van Nostrand Reinhold*, 1992, TCH500; TCH750