Surface Energy Data for PTFE: Polytetrafluoroethylene, CAS # 9002-84-0

Source[a]	Mst. Type[b]	Data[c]	Comments[d]
Fox, 1950[9]	Critical ST	γ_c = 18.5 mJ/m^2; 20°C	Test liquids not known.
Ellison, 1954[8]	Critical ST	γ_c = 18 mJ/m^2; 20°C	Various test liquids.
Fowkes, 1964[73]	Critical ST	γ_c = 19.5 mJ/m^2; no temp cited	Test liquids not known.
Hamilton, 1972[74]	Critical ST	γ_c = 18 mJ/m^2; no temp cited	Test liquids not known.
Wu, 1982[46]	Critical ST	γ_c = 19 mJ/m^2; 20°C	Test liquids not known.
Markgraf, 2005[62]	Critical ST	γ_c = 19-20 mJ/m^2; no temp cited	Test liquids not known.
Fox, 1950[9]	Contact angle	θ_W^Y = 108°; 20°C	Samples pressed against plate glass at 150°C, boiled in nitric–sulfuric acid, and triple rinsed in distilled water.
Owens, 1969[155]	Contact angle	θ_W^Y = 108°; no temp cited	
Dann, 1970[94]	Contact angle	θ_W^A = 112°; 25°C	Sessile drop method; surface cleaned with detergent and rinsed with distilled water.
Hu, 1970[233]	Contact angle	θ_W^A = 98°; no temp cited	
Kaelble, 1971[104]	Contact angle	θ_W^Y = 117°; 22°C	Sessile drop method; surface cleaned with detergent and rinsed with distilled water.
Collins, 1973[69]	Contact angle	θ_W^A = 109°; no temp cited	By sessile drops on tiltable stage.
El Shimi, 1974[156]	Contact angle	θ_W^Y = 112°; no temp cited	
Tamai, 1977[159]	Contact angle	θ_W^Y = 114°; no temp cited	
Moshonov, 1980[118]	Contact angle	θ_W^Y = 104°; no temp cited	Measured 60 secs. after application of water droplet; surface cleaned with isopropanol at 60°C and rinsed with methanol.
Penn, 1980[157]	Contact angle	θ_W^Y = 112°; no temp cited	
Omenyi, 1981[178]	Contact angle	θ_W^A = 104°; 20°C	
Wu, 1982[27]	Contact angle	θ_W^A = 109°, θ_W^R = 106° $d\theta_W$ = 3°; 20°C	
Busscher, 1983[158]	Contact angle	θ_W^Y = 116°; no temp cited	
Strobel, 1985[68]	Contact angle	θ_W^A = 121°; no temp cited	Commercial grade film, supplied by 3M Company.
Guiseppe, 1986[77]	Contact angle	θ_W^Y = 112°; no temp cited	
Janczuk, 1989[106]	Contact angle	θ_W^Y = 111°; 20°C	Polished, then triple boiled in HCl solution and rinsed with distilled water.
Sperati, 1989[222]	Contact angle	θ_W^A = 116°, θ_W^R = 92° $d\theta_W$ = 24°; no temp cited	
Egitto, 1990[65]	Contact angle	θ_W^Y = 116°; no temp cited	
Yasuda, 1994[160]	Contact angle	θ_W^Y = 100°; no temp cited	
Owen, 1996[136]	Contact angle	θ_W^A = 108°; no temp cited	
Brewis, 1998[153]	Contact angle	θ_W^A = 106°, θ_W^R = 90° $d\theta_W$ = 16°; no temp cited	
Cho, 2000[99]	Contact angle	θ_W^Y = 100°; no temp cited	Measured by sessile drop method.
Grundke, 2000[256]	Contact angle	θ_W^Y = 104°; no temp cited	Measured by ADSA.
Starov, 2000[282]	Contact angle	θ_W^Y = 105°; no temp cited	PTFE film, cleaned with alcohol and water, soaked in 50°C

			sulfochromic acid, rinsed with distilled water, and dried with pure nitrogen.
Owens, 1969[155]	Contact angle	γ_s = 19.1 mJ/m^2 (γ_s^d = 18.6, γ_s^p = 0.5); no temp cited	Test liquids: water and diiodomethane, by geometric mean equation.
Dann, 1970[94]	Contact angle	γ_s^d = 21mJ/m^2; 25°C	Various test liquids (extrapolated value).
Kaelble, 1971[104]	Contact angle	γ_s = 18.0 mJ/m^2 (γ_s^d = 16.9, γ_s^p = 1.1); 22°C	From contact angles with various test liquids.
Wu, 1971[29]	Contact angle	γ_s = 22.5 mJ/m^2 (γ_s^d = 20.5, γ_s^p = 2.0); 20°C	Test liquids: water and diiodomethane, by harmonic mean equation.
Kitazaki, 1972[191]	Contact angle	γ_s = 21.5 mJ/m^2 (γ_s^d = 19.4, γ_s^p = 2.1); no temp cited	Various test liquids; original results split polar component into hydrogen- and non-hydrogen bonding parameters.
Wu, 1979[45]	Contact angle	γ_c = 22.6 mJ/m^2; 20°C	Test liquids not known; calculated by the equation of state method.
Busscher, 1981[72]	Contact angle	γ_s = 22.1 mJ/m^2 (γ_s^d = 22.1, γ_s^p = 0.0); no temp cited	Test liquids: water and propanol.
Omenyi, 1981[178]	Contact angle	γ_s = 20.0 mJ/m^2; 20°C	Test liquids not known.
Janczuk, 1989[106]	Contact angle	γ_s = 21.8 mJ/m^2 (γ_s^d = 21.7; γ_s^p = 0.05); no temp cited	Various test liquids, by geometric mean equation.
Janczuk, 1989[108]	Contact angle	γ_s = 25.0 mJ/m^2 (γ_s^d = 25.0; γ_s^p = 0.0); no temp cited	Various test liquids, by harmonic-geometric mean equation.
Janczuk, 1989[108]	Contact angle	γ_s = 25.8 mJ/m^2 (γ_s^d = 25.8; γ_s^p = 0.0); no temp cited	Various test liquids, by harmonic mean equation.
Janczuk, 1990[105]	Contact angle	γ_s = 20.6 mJ/m^2; no temp cited	Test liquids: water and diiodomethane.
Janczuk, 1990[105]	Contact angle	γ_s = 21.4 mJ/m^2; no temp cited	Averaged over 28 test liquids.
Spelt, 1992[88]	Contact angle	γ_c = 20.0 mJ/m^2; 23°C	Test liquids not known; calculated by the equation of state method.
Morra, 1999[134]	Contact angle	γ_s = 20.1 mJ/m^2 (γ_s^{LW} = 20.1, γ_s^{AB} = 0.0, γ_s^+ = 0.0, γ_s^- = 0.0); no temp cited	Test liquids not known; acid-base analysis based on reference values for water of γ^+ = 48.5 mJ/m^2 and γ^- = 11.2 mJ/m^2.
Chang, 2000[162]	Contact angle	γ_s = 17.0 mJ/m^2; no temp cited	
Grundke, 2000[256]	Contact angle	γ_s = 20.1 mJ/m^2; no temp cited	
Della Volpe, 2000[163]	Contact angle	γ_s = 22.2 mJ/m^2; no temp cited	Re-calculated from data produced by Janczuk, 1990[105].
Schoff, 2003[263]	Contact angle	γ_s = 21.5 mJ/m^2 (γ_s^{LW} = 19.6, γ_s^{AB} = 1.9, γ_s^+ = 0.3, γ_s^- = 3.2); no temp cited	Test liquids not known; acid-base analysis.
Dettre, 1967[40]	From polymer melt	γ_s = 21.5 mJ/m^2; 20°C	Direct measurement of polymer melt extrapolated to 20°C; molecular formula $C_{21}F_{44}$; M_n = 1088.
Dettre, 1969[246]	From polymer melt	γ_s = 19.3 mJ/m^2; 20°C	Direct measurement of polymer melt extrapolated to 20°C; M_n = 1038.
Wu, 1971[29]	From polymer melt	γ_s = 26.5 mJ/m^2; 20°C	Direct measurement of polymer melt extrapolated to 20°C.
Wu, 1974[47]	From polymer melt	γ_s = 25.7 mJ/m^2; 20°C	Direct measurement of polymer melt extrapolated to 20°C; Infinite molecular weight.
Wu, 1974[47]	From polymer melt	γ_s = 23.9 mJ/m^2 (γ_s^d = 21.8, γ_s^p = 2.1); 20°C	Direct measurement of polymer melt extrapolated to 20°C; polarity calculated from interfacial tension with PE by

			harmonic mean. Infinite molecular weight.
Good, 1960[31]	Calculated	γ_s = 27.8 mJ/m^2; 20^{o}C	Calculated from low-molecular weight liquid homologs.
Good, 1960[31]	Calculated	γ_s = 21.0 mJ/m^2; 20^{o}C	Estimated from molecular constants, using *u* = 0 debye.
Good, 1964[16]	Calculated	γ_s = 24.0 mJ/m^2; 20^{o}C	Estimated from molecular constants, using *u* = 1.2 debyes.
Lee, 1968[131]	Calculated	γ_s = 17 mJ/m^2; no temp cited	Calculated from glass temperature of 223K.
Wu, 1968[182]	Calculated	γ_s = 21 mJ/m^2; 20^{o}C	Calculated from molecular constitution.
Sewell, 1971[193]	Calculated	γ_s = 15.8 mJ/m^2; no temp cited	Calculated from parachor and cohesive energy.
Sewell, 1971[193]	Calculated	γ_s = 14.7 mJ/m^2; no temp cited	Calculated by least squares from cohesive energy and molar volume.
Wu, 1974[47]	Calculated	γ_s = 25.8 mJ/m^2; 20^{o}C	Calculated from free volume theory and molecular weight.
Wu, 1974[47]	Calculated	γ_s = 25.9 mJ/m^2; 20^{o}C	Calculated from free volume theory and molecular weight.
Van Krevelen, 1976[85]	Calculated	γ_s = 26 mJ/m^2; no temp cited	Calculated from parachor parameter.
Wu, 1979[45]	Calculated	γ_s = 23.9 mJ/m^2; 20^{o}C	Calculated from liquid homologs. Infinite molecular weight.
Vargha-Butler, 1985[180]	Calculated	γ_s = 20.0 mJ/m^2; 23^{o}C	Calculated from sedimentation volume.
Owen, 1996[136]	Calculated	γ_s = 25.6 mJ/m^2; no temp cited	Direct measurement of liquid surface tension extrapolated to infinite molecular weight.
Grundke, 2000[256]	Calculated	θ_W^Y = 104^o; no temp cited	Calculated from capillary penetration into packed polymer powder.
Grundke, 2000[256]	Other	γ_s = 20.4 mJ/m^2; no temp cited	Determined by capillary penetration into packed polymer powder.