Surface Energy Data for PVC: Poly(vinyl chloride), CAS # 9002-86-2

Source[a]	Mst. Type[b]	Data[c]	Comments[d]
Ellison, 1954[8]	Critical ST	γ_c = 39 mJ/m^2; 20°C	Various test liquids; unplasticized PVC.
Lee, 1968[131]	Critical ST	γ_c = 39 mJ/m^2; no temp cited	Test liquids: water, glycerol, formamide, alcohols, and long-chain polyglycols.
Crocker, 1969[111]	Critical ST	γ_c = 30 mJ/m^2; 20°C	Test liquids not known.
Dann, 1970[94]	Critical ST	γ_c = 30.5 mJ/m^2; 25°C	Ethylene glycol/2-ethoxyethanol mixes, based on advancing contact angles.
Dann, 1970[94]	Critical ST	γ_c = 49 mJ/m^2; 25°C	Ethylene glycol/2-ethoxyethanol mixes, based on retreating contact angles.
Dann, 1970[94]	Critical ST	γ_c = 31.5 mJ/m^2; 25°C	Polyglycol blends, based on advancing contact angles.
Dann, 1970[94]	Critical ST	γ_c = 49 mJ/m^2; 25°C	Polyglycol blends, based on retreating contact angles.
Dann, 1970[94]	Critical ST	γ_c = 31 mJ/m^2; 25°C	Formamide/2-ethoxyethanol mixes, based on advancing contact angles.
[d]Dann, 1970[94]	Critical ST	γ_c = >56 mJ/m^2; 25°C	Formamide/2-ethoxyethanol mixes, based on retreating contact angles.
[d]Dann, 1970[94]	Critical ST	γ_c = >56 mJ/m^2; 25°C	Per ASTM D-2578, using formamide/2-ethoxyethanol mixes.
Markgraf, 2005[62]	Critical ST	γ_c = 39 mJ/m^2; no temp cited	Test liquids not known; unplasticized PVC.
Markgraf, 2005[62]	Critical ST	γ_c = 33-38 mJ/m^2; no temp cited	Test liquids not known; plasticized PVC.
Dann, 1970[94]	Contact angle	θ_W^A = 83°; 25°C	Sessile drop method; surface cleaned with detergent and rinsed with distilled water.
Wu, 1971[29]	Contact angle	θ_W^Y = 87°; 20°C	Unplasticized PVC.
Moshonov, 1980[118]	Contact angle	θ_W^Y = 85°; no temp cited	Measured 60 secs. after application of water droplet; surface cleaned with petroleum ether and rinsed with methanol. PVC contained 20% dioctyl phthalate.
Triolo, 1983[189]	Contact angle	θ_W^R = 75.3°; no temp cited	Spin cast on silanized coverslips. Fully hydrated sample immersed in water; interface with advancing, submerged octane bubble.
Jonsson, 1992[112]	Contact angle	θ_W^Y = 60°; no temp cited	PVC with <0.5% plasticizer or stabilizer. Cleaned by sonification in a 70/30 ethanol/water solution and rinsed with distilled water.
Fukuzawa, 1994[113]	Contact angle	θ_W^Y = 82.5°; no temp cited	Contact angle measured after stabilizing for 15 secs.
Cho, 2000[99]	Contact angle	θ_W^Y = 80°; no temp cited	Measured by sessile drop method.
Etzler, 2000[171]	Contact angle	θ_W^A = 94.7°; 20°C	Measured by Wilhelmy plate method.
McCafferty, 2000[217]	Contact angle	θ_W^Y = 87.8°; no temp cited	Surface cleaned with light methanol wipe.
B.-Petermann, 2003[139]	Contact angle	θ_W^Y = 89°; 20°C	Measured by sessile drop method. Roll-coated polymer topcoat applied to carbon steel; surface degreased with ethanol, cleaned with detergent, and rinsed in distilled water. PVC contained linear alkyl groups as plasticizer.

B.-Petermann, 2003[106]	Contact angle	θ_W^Y = 94°; 20°C	Measured by sessile drop method. Roll-coated polymer topcoat applied to carbon steel; surface degreased with ethanol, cleaned with detergent, and rinsed in distilled water. PVC contained phthalates as plasticizer.
Balasz, 2005[254]	Contact angle	θ_W^A = 98°; no temp cited	
Shafrin, 1963[201]	Contact angle	γ_s = 41.5 mJ/m² (γ_s^d = 40.0, γ_s^p = 1.5); no temp cited	Test liquids not known.
Dann, 1970[94]	Contact angle	γ_s^d = 39 mJ/m²; 25°C	Various test liquids.
Wu, 1971[29]	Contact angle	γ_s = 41.5 mJ/m² (γ_s^d = 39.8; γ_s^p = 1.7); 20°C	Test liquids: water and diiodomethane, by geometric mean equation; unplasticized polymer.
Wu, 1971[29]	Contact angle	γ_s = 41.9 mJ/m² (γ_s^d = 35.6; γ_s^p = 6.3); 20°C	Test liquids: water and diiodomethane, by harmonic mean equation; unplasticized polymer.
Kitazaki, 1972[191]	Contact angle	γ_s = 44.0 mJ/m² (γ_s^d = 43.7, γ_s^p = 0.3); 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 = 43.8 mJ/m²; 20°C	Test liquids not known; calculated by the equation of state method.
van Oss, 1989[22]	Contact angle	γ_s = 43.8 mJ/m² (γ_s^{LW} = 43.0, γ_s^{AB} = 0.8, γ_s^+ = 0.04, γ_s^- = 3.5); 20°C	Test liquids: water, alpha-bromonaphthalene, diiodomethane, formamide, and glycerin; acid-base analysis.
Fukuzawa, 1994[113]	Contact angle	γ_s = 35.8 mJ/m² (γ_s^{LW} = 34.7, γ_s^{AB} = 1.1, γ_s^+ = 0.05, γ_s^- = 6.2); no temp cited	Test liquids: water, formamide, and diiodomethane; acid-base analysis, calculated per Good and Van Oss[86]. Contact angles measured after stabilizing for 15 secs.
Fukuzawa, 1994[113]	Contact angle	γ_s = 38.3 mJ/m²; no temp cited	Test liquids: water, formamide, and diiodomethane; acid-base analysis calculated by arithmetic and geometric means.
Lloyd, 1995[218]	Contact angle	γ_s^+ = 0.2, γ_s^- = 3.1; no temp cited	Test liquids not known; acid-base analysis.
Lee, 1999[116]	Contact angle	γ_s = 44 mJ/m² (γ_s^{LW} = 43, γ_s^{AB} = 1.0, γ_s^+ = 0.1, γ_s^- = 2.4); 20°C	Test liquids: water, alpha-bromonaphthalene, diiodomethane, formamide, and glycerin; acid-base analysis, based on reference values for water of γ^+ = 34.2 mJ/m² and γ^- = 19 mJ/m².
Morra, 1999[134]	Contact angle	γ_s = 39.5 mJ/m² (γ_s^{LW} = 39.1, γ_s^{AB} = 0.4, γ_s^+ = 0.06, γ_s^- = 0.9); no temp cited	Test liquids not known; acid-base analysis based on reference values for water of γ^+ = 48.5 mJ/m² and γ^- = 11.2 mJ/m².
Etzler, 2000[171]	Contact angle	γ_s = 32.5 mJ/m² (γ_s^{LW} = 32.5, γ_s^{AB} = 0.0, γ_s^+ = 0.0, γ_s^- = 0.4); 20°C	Various test liquids; acid-base analysis, by Good-van Oss method. Commercial sample, unknown plasticizer content.
McCafferty, 2000[217]	Contact angle	γ_s = 43.0 mJ/m² (γ_s^{LW} = 40.2, γ_s^{AB} = 2.8, γ_s^+ = 0.4, γ_s^- = 5.1); no temp cited	Test liquids: water, diiodomethane, formamide, glycerin, and ethylene glycol; acid-base analysis. Cleaned with methanol wipe.
Berta, 2003[262]	Contact angle	γ_s = 38 mJ/m² (γ_s^d = 31.6; γ_s^p = 6.4); no temp cited	Test liquids not known.
B.-Petermann, 2003[139]	Contact angle	γ_s = 35.2 mJ/m² (γ_s^d = 33.6; γ_s^p = 1.6); 20°C	Test liquids: water, diiodomethane, and formamide, measured by sessile drop method. Roll-coated polymer topcoat applied to carbon steel; surface degreased with ethanol, cleaned with detergent, and rinsed in distilled water. PVC contained linear alkyl groups as plasticizer.

B.-Petermann, 2003[139]	Contact angle	γ_s = 33.1 mJ/m^2 (γ_s^d = 32.3; γ_s^p = 0.8); 20^{o}C	Test liquids: water, diiodomethane, and formamide, measured by sessile drop method. Roll-coated polymer topcoat applied to carbon steel; surface degreased with ethanol, cleaned with detergent, and rinsed in distilled water. PVC contained phthalates as plasticizer.
Wu, 1971[29]	From polymer melt	γ_s = 43.8 mJ/m^2 (γ_s^d = 39.0; γ_s^p = 4.8); 20^{o}C	Direct measurement of polymer melt extrapolated to 20^{o}C; polarity calculated from interfacial tension with PE by harmonic mean.
Wu, 1982[18]	From polymer melt	γ_s = 42.9 mJ/m^2; 20^{o}C	Direct measurement of polymer melt extrapolated to 20^{o}C. Unplasticized PVC.
Lee, 1968[131]	Calculated	γ_s = 36 mJ/m^2; no temp cited	Calculated from glass temperature of 354K.
Wu, 1968[182]	Calculated	γ_s = 43 mJ/m^2; 20^{o}C	Calculated from molecular constitution.
Sewell, 1971[193]	Calculated	γ_s = 42.9 mJ/m^2; no temp cited	Calculated from parachor and cohesive energy.
Van Krevelen, 1976[85]	Calculated	γ_s = 42 mJ/m^2; no temp cited	Calculated from parachor parameter.
Wu, 1982[18]	Calculated	γ_s = 38.0 mJ/m^2; 20^{o}C	Calculated from cohesive energy density and solubility parameters.
Surface-tension.de, 2007[110]	Unknown	γ_s = 41.5 mJ/m^2 (γ_s^d = 39.5, γ_s^p = 2); 20^{o}C	No details available.