

TABLE 11.4 Comparison of experimental surface energies with those calculated on the basis of the Lifshitz theory

Material (ϵ) in ordering of increasing ϵ	Theoretical A (10^{-20} J)	Surface energy, γ (mJ m^{-2})	
		$A/24\pi D_0^2$ ($D_0 = 0.165$ nm)	Experimental ^a (20°C)
Liquid helium (1.057)	0.057	0.28	0.12–0.35 (4–1.6 K)
<i>n</i> -Pentane (1.8)	3.75	18.3	16.1
<i>n</i> -Octane (1.9)	4.5	21.9	21.6
Cyclohexane (2.0)	5.2	25.3	25.5
<i>n</i> -Dodecane (2.0)	5.0	24.4	25.4
<i>n</i> -Hexadecane (2.1)	5.2	25.3	27.5
PTFE (2.1)	3.8	18.5	18.3
CCl_4 (2.2)	5.5	26.8	29.7
Benzene (2.3)	5.0	24.4	28.8
Polystyrene (2.6)	6.6	32.1	33
Polyvinyl chloride (3.2)	7.8	38.0	39
Acetone (21)	4.1	20.0	23.7
Ethanol (26)	4.2	20.5	22.8
Methanol (33)	3.6	18	23
Glycol (37)	5.6	28	48
Glycerol (43)	6.7	33	63
Water (80)	3.7	18	73
H_2O_2 (84)	5.4	26	76
Formamide (109)	6.1	30	58

^a Note the good agreement between theory and experiment (within 20%) except for the last six strongly H-bonding liquids.