1.3.11 Colloid and surface chemistry

Name	*Symbol*	*Definition*	*SI unit*	*Notes*
specific surface area	a, a_s, s	$a = A/m$	$m^2\ kg^{-1}$	
surface amount of B, adsorbed amount of B	n_B^s, a_B^a		mol	(1)
surface excess of B	n_B^σ		mol	(2)
surface excess concentration of B	Γ_B, (Γ_B^σ)	$\Gamma_B = n_B^\sigma/A$	$mol\ m^{-2}$	(2)
total surface excess concentration	Γ, (Γ^σ)	$\Gamma = \sum_i \Gamma_i$	$mol\ m^{-2}$	
area per molecule	a, σ	$a_B = A/N_B^\sigma$	m^2	(3)
area per molecule in a filled monolayer	a_m, σ_m	$a_{m,B} = A/N_{m,B}$	m^2	(3)
surface coverage	θ	$\theta = N_B^\sigma/N_{m,B}$	1	(3)
contact angle	θ		1, rad	
film thickness	t, h, δ		m	
thickness of (surface or interfacial) layer	τ, δ, t		m	
surface tension, interfacial tension	γ, σ	$\gamma = (\partial G/\partial A_s)_{T,p}$	$N\ m^{-1}$, $J\ m^{-2}$	

(1) The values of n_B^s depends on the thickness assigned to the surface layer.

(2) The values of n_B^σ and Γ_B depend on the convention used to define the position of the Gibbs surface. They are given by the excess amount of B or surface concentration of B over values that would apply if each of the two bulk phases were homogeneous right up to the Gibbs surface. See PAC 31 (1972) 377-638.

(3) N_B^σ is the number of adsorbed molecules ($N_B^\sigma = Ln_B^\sigma$), and $N_{m,B}$ is the number of adsorbed molecules in a filled monolayer. The definition applies to entities B.

Name	*Symbol*	*Definition*	*SI unit*	*Notes*
film tension	Σ_f	$\Sigma_f = 2\gamma_f$	N m^{-1}	(4)
reciprocal thickness of the double layer	κ	$\kappa = (2F^2 I_c/\varepsilon RT)^{½}$	m^{-1}	
average molar masses				
number-average	M_n	$M_n = \Sigma n_i M_i / \Sigma n_i$	kg mol^{-1}	
mass-average	M_m	$M_m = \Sigma n_i M_i^2 / \Sigma n_i M_i$	kg mol^{-1}	
Z-average	M_z	$M_z = \Sigma n_i M_i^3 / \Sigma n_i M_i^2$	kg mol^{-1}	
sedimentation coefficient	s	$s = v/a$	s	(5)
van der Waals constant	λ		J	
retarded van der Waals constant	β, B		J	
van der Waals-Hamaker constant	A_H		J	
surface pressure	π^s, π	$\pi^s = \gamma^0 - \gamma$	N m^{-1}	(6)

(4) The definition applies only to a symmetrical film, for which the two bulk phases on either side of the film are the same, and γ_f is the surface tension of a film/bulk interface.

(5) In the definition, v is the velocity of sedimentation and a is the acceleration of free fall or centrifugation. The symbol for a limiting sedimentation coefficient is [s], for a reduced sedimentation coefficient, $s°$, and for a reduced limiting sedimentation coefficient [$s°$].

(6) In the definition, γ^0 is the surface tension of the clean surface and γ that of the covered surface.