Notation

A	intensity of dissipation (in flow)
A	area of an ellipse in a dynamic experiment
A	constant in some equations
$A_{(n)}$	the Rivlin-Erickson tensor of the n-th order
a	thermal diffusivity
a	dimensionless amplitude in the theory of vibration viscometry
a	arbitrary coefficient, constant in different equations
a, b	semi-axes of an ellipse
a	length of a side of a triangle
a_T	temperature shift factor
a_1, a_2, a_3	components of the acceleration vector
a_{ij}	components of the gradient of velocity tensor (i = 1, 2, 3 and j = 1, 2, 3)
B	bulk modulus of elasticity (compressibility)
B*	complex bulk modulus of elasticity
B	magnetic flux density
$B_{(n)}$	the White-Metzner tensor of the n-th order
B	width (of a slit channel)
B	constant in some equations
b	baric coefficient of viscosity
b	power factor in a molecular model
b	arbitrary coefficient, constant in different equations
C	electrical capacitance (in a model representation)
C	step in a discrete relaxation spectrum
C	(with different indexes) coefficients in different equations
C_{ij}	the Cauchy-Green tensor (i = 1, 2, 3 and j = 1, 2, 3)
C^{-1}_{ij}	the Finger tensor (i = 1, 2, 3 and j = 1, 2, 3)
$C_{I, inv}$	the first invariant of the Cauchy-Green tensor
$C^{-1}_{I, inv}$	the first invariant of the Finger tensor
C_k	the Jaumann tensor derivative
c	concentration (in volume units)
c*	critical concentration (in liquid-crystal solutions)
c, c_p	heat (thermal) capacity
c	arbitrary coefficient
D	diameter (of a tube, capillary)
D_{ij}	components of the deformation rate tensor (i = 1, 2, 3 and j = 1, 2, 3)
D_2	the second invariant of the deformation rate tensor

DR	draw ratio
d_{ij}	components of a small deformation tensor (i = 1,2, 3 and j = 1, 2, 3)
d_1, d_2, d_3	principal values of a small deformation tensor
$d_{ij}^{(dev)}$	deviatoric part of the d_{ij} tensor
d_s	surface area based average diameter
E	functional of errors (in fitting experimental data)
E	number of entanglements per chain
E_1, E_2, E_3	invariants of a tensor of large deformations
E	measure of non-linear large deformations
E	Young's (elastic) modulus
E_0	instantaneous modulus
E*	complex dynamic modulus (in extension)
E'	real part of complex modulus (storage modulus)
E''	imaginary part of complex modulus (loss modulus)
E_∞	equilibrium modulus
E_N^0	plateau modulus
E_{ijmn}	components of elastic modulus for an anisotropic material
E_a	activation energy
E	strength of an electrical field
F	kernel function in different models of mixing
F	force
F_x, F_y	components of forces acting along coordinate axes
F*	limiting (critical) value of force
F_0	constant force; initial force
F_Y	strength of material
F_{sp}	force acting on a spring in model representation
F_{pist}	force acting on a piston in model representation
F_1, F_2, F_3	components of force vector
F_n	normal force
F_σ	tangential force
f	coefficient of friction
f	frequency of oscillation (in Hz)
f_0	local coefficient of friction
f_E	engineering stress
f_M	neo-Hookean engineering stress
f(x)	arbitrary function of argument x
G	shear modulus
G	constants in the theories of large deformations (with different indices)
G	weight output
G_e	elastic (rubbery) modulus
G_i, G_n	partial shear modulus in a discrete relaxation spectrum
G_N^0	plateau shear modulus
G_r	relaxation modulus
G_∞	equilibrium shear modulus
G_∞	final value of shear modulus in curing

G_0	instantaneous shear modulus
$G(\theta)$	relaxation time spectrum (measured in shear)
G^*	complex dynamic modulus (in shear)
G'	real component of complex shear modulus (storage shear modulus)
G''	imaginary component of complex shear modulus (loss shear modulus)
G'_{exp}, G''_{exp}	experimental values of G' and G", respectively
G'_{cal}, G''_{cal}	calculated values of G' and G", respectively
g	gravitational constant
g_i^σ	measured value of a function in a regularization method
g_{ij}	components of tensor of relative displacements (i = 1, 2, 3 and j = 1, 2, 3)
H	distance; height; sagging
H	heat of transition
h	distance, gap, height
$h(\ln\theta)$	(with different indices) logarithmic relaxation spectrum
I	moment of inertia
$[I]$	concentration of an initiator
I_s	coupled moment of inertia
I_1, I_2, I_3	invariants of the stress tensor
I_E	the sum of the non-linear measures of deformations, E
I_{opt}	intensity of light transmission
J	compliance; viscoelastic compliance
J_c	creep compliance
J_0	instantaneous compliance
J_e	equilibrium shear compliance
J_s	steady state compliance
J_s^0	initial (linear) value of compliance
J^*	complex compliance (in shear)
J'	real part of complex compliance
J''	imaginary part of complex compliance
$J(\lambda)$	retardation time spectrum
J_i	partial compliance
J	electrical current
K	empirical parameters (with different indices)
K	kernel in an integral equation used in a regularization method
K	shape factor, geometrical factor or form factor
K_{cr}	the Von Mises criterion of plasticity
K_H	the Huggins constant
K_M	the Martin constant
K_K	the Kraemer constant
k	kinetic rate constant (with different indices)
k	the Boltzmann constant
k	temperature coefficient of viscosity
k	coefficient in different equations (with different indices)
k	parameter in the theory of oscillations
$k(\ln\lambda)$	logarithmic retardation spectrum

k	ratio of radii
k_u	factor in the theory of vibration viscometry
k_ω	coefficient of resistance in vibrations
$L_{a,b}$	rate of formation of junctions in a network model
L	length
L	parameter in the theory of torsion oscillations
l	current length
l	coefficients in different equations (with different indices)
l_0	initial length
l_f	length of a sample after elongational flow
M or MM	molecular mass
$\overline{M}_n$, $\overline{M}_w$, $\overline{M}_z$, $\overline{M}_{z+1}$	number-, weight-, z- and (z+1)- molecular masses, respectively
$\overline{M}_{w,bl}$	weight-averaged molecular mass of a blend
$\overline{M}_\eta$	viscometric-averaged molecular mass
M_0	molecular mass of a monomer unit
M_c	critical molecular mass (for entanglement formation)
M_e	molecular mass of chain segment between entanglements
M	number of elements in model
MFI	melt flow index
m, m_e	reduced values of molecular mass
m_k	entrance correction factor
m	mass
m	memory function
m	arbitrary index
m	exponent in different empirical equations
m_0	reduced mass
m_s	doubled, coupled mass
N	number of elements in model or in a polymer chain
N	rotational speed of screw
N_1	first normal stress function
N_1^+	first normal stress growth function
N_1^-	first normal stress decay function
$N_{1,c}$	permanent component in the first normal stress function in oscillations
$N_{1,osc}$	amplitude of oscillations of the first normal stress function in periodic deformation
N_2	second normal stress function
N_c	intensity of nuclei formation
n_1, n_2, n_3	components of the normal to a surface
n	ordinary number in different sequences
n	exponent in different empirical equations
n	refraction index
n_∞	limiting value of refraction index
P, p	pressure at the entrance to a channel; current pressure
P_k	pressure drop responsible for kinetic energy losses; pressure drop responsible for end-correction

P_v	part of the pressure drop responsible for resistance of a channel
p	amplitude ratio (in linear displacement or in torsion)
p_{max}	maximum pressure developed in a single-screw extruder
Q	volume output
Q	electrical charge
Q_0	initial charge of capacitor in a model representation
Q_∞	equilibrium charge of capacitor in a model representation
q	distributed load
q	parameter of a molecular model
R	universal gas constant
R	radius
R_i, R_o	inner and outer radii of cylinders, respectively
$\bar{R}$	average radius
R_0	initial radius of a sample in a squeezing plastometer
R	electrical resistance (in a model representation)
R_m	real (active) part of mechanical impedance
r	(current) radius; radial coordinate
r_0	initial radius
r_Y	radius of a plasticity zone in flow of a viscoplastic liquid
S	surface area in different equations: rectangular in dynamic measurements, under a relaxation curve and in other cases
S_R	swell ratio
s	distance between two points
s	scaling factor
T	torque
T*	limiting value of torque
T	intensity of shear stresses
T	absolute temperature (in K)
$\underline{T}$	period of oscillation
$\tilde{T}$	dimensionless induction period (in curing)
T_{def}	characteristic time of deformation
T_{ent}	life-time of entanglements
T_0	reference temperature
T_g	glass transition temperature
T_m	phase transition temperature, melting point
T_m^0	equilibrium phase transition temperature
t, t'	current and past time, respectively
t*	critical time (in different applications)
t*	gel-time
$t_{m\text{-}g}$	time of micro-gelation
t_{inh}	inherent time scale of material
t_{obs}	characteristic time of observation
t_{sw}	characteristic time of switching
t_n	non-isothermal induction period (in curing)
U	voltage

U_0	initial voltage
U_0	velocity of the movement of meniscus
U_∞	steady velocity (in different cases)
u	displacements of elements of a molecular model (with different indices)
u	current velocity
u_1, u_2, u_3	components of the displacement vector
u_0	speed of a jet flight
V	average deviation in a regularization method
V, V_0	velocity; initial velocity
V_s	slip velocity
V_∞	velocity of a steady movement
V_{max}	maximum velocity in the velocity distributions
$\overline{V}$, V_{av}	average velocity
V, V_0	volume; initial volume
V*	volume after deformation
V_{ell}	volume of an ellipsoid (after deformation)
V_{sph}	volume of a sphere
v_1, v_2, v_3	components of the velocity vector
W	work; work per cycle in a dynamic loading; stored elastic energy; intensity of energy dissipation
W_{sh}	energy responsible for shape changes
W	(with different indices) elastic potential (in non-linear models and theories of elasticity)
W	distance between the neighboring flights of screw
w_{ij}	components of the vorticity tensor (i = 1, 2, 3 and j = 1, 2, 3)
w	weight fraction in mixture
X*	complex amplitude of displacement
X	displacement in a model representation
X_m	imaginary (reactive) part of mechanical impedance
X_0	initial displacement in a model representation
X_0	initial value of an arbitrary parameter X
X_{sp}	displacement of a spring in a model representation
X_{pist}	displacement of a piston in a model representation
X	arbitrary parameter
X_∞	equilibrium value of an arbitrary parameter X
X_1, X_2, X_3	components of the body force
x_1, x_2, x_3	the Cartesian coordinate axes
x	variable in various equations
x_{0A}, x_{0B}	amplitudes of displacement of plates A and B, respectively
$x_{0,\,B}^{max}$	maximum (resonance) amplitude of displacement of plate B
Y	arbitrary variable
Y*	complex mechanical impedance
y	coordinate axis
y	variable in some calculations
y_0	insertion depth in a viscometry

Z	rigidity of spring
z	coordinate axis
z_0	distance equal to reciprocal of attenuation

Greek letters

α	arbitrary angle; angle in a cone-plate viscometer
α	(with different indexes) arbitrary factors in different equations
α	degree of crystallinity
α	coefficient of thermal expansion
α	phase angle
β	angle in a cone-plate viscometer device
β	angle of contact formed by meniscus
β	constant (coefficient) in different equations; scaling factor
β	degree of conversion
β^*	degree of conversion at the gel-point
Γ	parameter in the theory of wave propagation
Γ	dimensionless shear rate
γ	shear deformation
γ	dimensionless viscosity in the theory of vibration viscometry
γ_r	recoil shear strain or elastic (recoverable) deformation
γ_r^*	critical value of elastic deformation (for onset of instability in flow)
γ_f	irreversible shear deformation (in flow)
γ_m	shear deformation corresponding to maximum stress
$\dot{\gamma}$	deformation rate (in a simple shear)
$\dot{\gamma}_R$	deformation rate at the channel wall (in a simple shear)
$\dot{\gamma}_0$	constant shear rate; initial shear rate; average shear rate
$\dot{\gamma}_0^*$	apparent average shear rate (in flow with slip)
γ_N	quasi-Newtonian shear rate
$\dot{\gamma}_H^H$	shear rate at the slit wall
$\dot{\gamma}_H$	average shear rate in a slit
$\dot{\gamma}_0$	maximum shear rate (in viscometer)
$\dot{\gamma}_m$	critical shear rate (at the spurt point)
γ_s	change (of something)
Δ	measure of the rate of damping in oscillations (logarithmic decrement of damping)
Δ	clearance between coaxial cylinders
δ	loss angle (in periodic oscillations)
δ	wall thickness of cylinder
δ	angle between plate and conical surface in viscometer
δ	clearance
δ	attenuation
δ_{ij}	the Kroneker Delta (unit tensor)
ε	ratio of stresses in a rotational viscometer
ε	relative change of distance (strain in tensile extension)
ε	deformation (of any type)
ε_0	initial deformation; constant deformation (in relaxation); amplitude of

	deformation (in periodic oscillation)
$\varepsilon_{r,0}$	characteristic recoverable deformation – empirical parameter (in extension)
$\varepsilon_{M,\,sp}$; ε_K; $\varepsilon_{M,\,pist}$	deformation of model elements in a model representation
ε_V	relative change of volume (volume deformation)
ε_{ij}	components of a tensor of large deformations (i = 1, 2, 3 and j = 1, 2, 3)
ε'_{ij}	deviatoric components of the deformation tensor
ε_1, ε_2, ε_3	principal values of the ij-tensor
ε^*	engineering measure of deformation
ε^H	the Hencky measure of deformation
ε_{inf}	residual deformation (in creep)
ε_{r_*}	tensile recoil (recoverable deformations stored in extension)
ε_r	critical elastic deformation in extension (at the moment of rupture)
$\dot{\varepsilon}$	deformation rate (in extension)
ζ	constant in a kinetic equation
η	viscosity; apparent (non-Newtonian) viscosity
η_0	initial (Newtonian) viscosity; viscosity of a solution
η^0	viscosity at zero pressure
η_∞	upper (high-shear rate) Newtonian viscosity
η_s	solvent viscosity
η_M, η_K	viscosities of elements in a model representation
η^*	complex dynamic viscosity
η'	real part of complex dynamic viscosity
η''	imaginary part of complex dynamic viscosity
$\eta_{\parallel}$	viscosity of an anisotropic liquid measured in direction parallel to shear
$\eta_{\perp}$	viscosity of an anisotropic liquid measured in direction orthogonal to shear
η_B	biaxial stress growth coefficient
$[\eta]$	intrinsic viscosity
η_p	constant “plastic” viscosity
η_∞	limiting viscosity at high shear rates
$\tilde{\eta}$	dimensionless viscosity
$\bar{\eta}$	average viscosity (in viscometer)
θ	angular coordinate
θ	angle in different expressions
θ_{ij}	components of the tensor of rotation (turn) (i = 1, 2, 3 and j = 1, 2, 3)
θ	characteristic time of process (with different indices); relaxation time in discrete spectrum
θ_c, θ_d	constants characteristic times in a tube model
θ_{max}, θ_{min}	maximum and minimum relaxation times in a spectrum
θ_K	the Kohlrausch relaxation time
θ_0^*	complex amplitude of twisting
θ_{0_*}	amplitude of twisting
θ_B^*	complex amplitude of twisting for body B
θ_{0A}	angular amplitude of twisting of body A
κ	coefficient of the thermal conductivity
λ	retardation time

λ	retardation time in a discrete spectrum (with different indices)
λ_{max}, λ_{min}	maximum and minimum values of retardation time in a discrete spectrum
λ	wavelength
λ	dimensionless frequency in the theory of vibration viscometry
λ	extension ratio
λ	heat transfer coefficient
λ	regularization parameter
λ_1, λ_2, λ_3	extension ratios along the principal axes
λ	coefficient of friction (of hydrodynamic resistance)
λ_R	coefficient of friction (of hydrodynamic resistance) expressed via radius
μ	Poisson's ratio (coefficient)
ν	empirical parameter
ξ	function characterizing non-linear effects
ρ	density
ρ_0	density at the reference temperature T_0
ρ_s	density of a solid body moving in liquid
ρ_l	density of liquid
Σ	sum
σ	various stresses; shear stress
σ	surface tension
σ_0	initial stress; constant stress (in creep); amplitude of stress (in periodic oscillation)
$\sigma_{E,\,0}$	characteristic stress (empirical parameter) in extension
σ_E	normal (tensile) stress
σ_Y	yield stress
σ_R	shear stress at the tube wall of capillary; maximum shear stress on surface
σ_{ij}	components of stress tensor in the Cartesian coordinates (i = 1, 2, 3 and j = 1, 2, 3)
σ'_{ij}	deviatoric components of the stress tensor
σ_{ij}	components of stress tensor in polar coordinates (i = θ, r, z and j = θ, r, z)
σ_{max}	maximum stress; limit of shear stress
σ_1, σ_2, σ_3	principal stresses
$\sigma_{1,\,max}$, $\sigma_{2,\,max}$, $\sigma_{3,max}$	maximum shear stresses (invariants, expressed in shear stresses)
$\underline{\sigma}_i$, σ_o	stresses at the inner and outer surfaces of coaxial cylinders, respectively
$\bar{\sigma}$, σ_{av}	average shear stress
σ_α	stress at a surface in a cone-plate viscometer
σ_θ	circumferential stress
σ_z	longitudinal stress
σ_{res}	residual stress (in relaxation)
$\sigma_{E,\,ext}$, $\sigma_{E,\,compr}$	normal stresses in extension and compression, respectively
σ^*	characteristic shear stress
σ^*, σ_E^*	stress limits of elasticity (critical stress for transition to plastic deformation in solids)
σ_H	shear rate at the slit wall
σ_s	critical stress (spurt stress)

σ^+	shear growth stress function
σ^-	shear stress decay function
σ_E^+	tensile growth stress function
σ_E	critical stress (at the moment of rupture)
φ	angle in the theory of break of solids
φ	angle of inclination in some instruments
φ	relaxation function
φ	concentration (in volume parts)
φ^*	critical concentration
χ	correction factor
Ψ_1	the first normal stress coefficient
Ψ_2	the second normal stress coefficient
$\Psi_{1,0}$	initial ("linear") value of the first normal stress coefficient
Ψ_0	permanent component of the first normal stress coefficient in oscillation
Ψ'	real part of the complex first normal stress coefficient in oscillation
Ψ''	imaginary part of the complex first normal stress coefficient in oscillation
ψ	creep function
Ω	angle of twisting
Ω	rotational speed
Ω_i, Ω_o	rotational speed of inner and outer cylinders, respectively
ω	angular velocity; frequency
ω_0	own (resonance) frequency
ω_{max}, ω_{min}	upper and lower boundaries of frequency window in measurement of dynamic modulus

De	the Deborah number
Mn	the Mason number
Re	the Reynolds number
Re_R	the Reynolds number expressed via radius
Re_c	the critical Reynolds number in rotational flows
We	the Weber number
Wi	the Weissenberg number

Vectors

A	acceleration vector
F	force
r	radius-vector
n	normal to the surface
u	displacement vector
v	velocity vector
X	body force