Definitions of symbols in “Polymer Physics” by Rubinstein & Colby

symbol	name	defined as	equal to	proviso
M	molecular weight	mass of one mole of polymerr	$M = M_oN$	end groups’ contribution neglected
M_o	monomer molecular weight	mass of one mole of repeating units in a polymer chain		primary structure specified
N	degree of polymerization	number of repeating units in a polymer chain		end groups not counted
$\cong$		numerical approximation		
$\approx$		proportional with dimensionless const		
$\sim$		proportional with dimensional const		
r	linear dimension	a measure of size of an object		
m	mass	a mass of an object		
D	fractal dimension	exponent of linear dimension’s proportionality to mass	$m \sim r^D$, $m_1 = C_m m_2$ $r_1 = C_r r_2$ $D = \log C_m / \log C_r$	
c	polymer concentration	mass of polymers of all sizes per unit volume of solution	$c = \sum_{N=1}^{\infty} c_N$	
c_N	concentration of N-mer	mass of N-mer per unit volume of solution		
ϕ	volume fraction	fraction of occupied volume of polymers per unit volume of solution	$\phi = c/\rho$	polymer density in bulk is the same as in solution
ρ	polymer density	density of polymer in bulk state		
v_m	molar volume of monomer	volume of one mole of repeating unit	$v_m = M_o/\rho$	
v_o	monomer molecular volume	volume of a repeating unit	$v_o = v_m / N_{AV}$	
V	pervaded volume	volume of solution spanned by a polymer chain in solution		

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ϕ^*	overlap volume fraction	volume fraction of occupied volume of a polymer chain in a pervaded volume	$\phi^* = N v_o / V$	
P	overlap parameter	ratio of volume fraction to overlap volume fraction	$P = \phi V / N v_o$	
n_N	mole fraction of polymer with dp equals N, or mole fraction of N-mer	number of moles of N-mer relative to number of moles of polymers of all sizes.	$n_N = \dfrac{c_N / M_N}{\sum(c_N / M_N)}$	
w_N	weight fraction of N-mer	mass of N-mer relative to the total mass of polymers of all sizes	$w_N = \dfrac{c_N}{\sum c_N}$	
z_N	z-fraction of N-mer		$z_N = \dfrac{c_N M_N}{\sum c_N M_N}$	
"C"	molar concentration of polymer	total number of moles of polymers of all sizes per unit volume of solution	$C = \sum\left(\dfrac{c_N}{M_N}\right)$	
"C_N"*	molar concentration of N-mer	number of moles of N-mer per unit volume of solution	$C_N = \dfrac{c_N}{M_N}$	
"ρ_n"	number density of polymer	total number of molecules of all sizes	$\rho_n = N_{AV} \cdot \sum\left(\dfrac{c_N}{M_N}\right)$	
M_n	number average molecular weight		$M_n = \sum M_N \cdot n_N$	
M_w	weight average molecular weight		$M_w = \sum M_N \cdot w_N$	
M_z	z-average molecular weight		$M_z = \sum M_N \cdot z_N$	
p	extent of reaction of polycondensation		$p \leq 1$	
n (p, N)	mole fraction of N-mer at p for polycondensation		$n(p, N) = p^{N-1} \cdot (1-p)$	