

Process Intensification and Green Chemistry – Notation and Symbolology

Chapter 9: RTD in Microreactors

Roman symbol	Definition	Units
Bo	Bodenstein number	
$c(t)$	outlet molar concentration of tracer	mol/m^3
c_0	initial molar concentration of tracer	mol/m^3
d	inner channel diameter	m
d_c or d_{coil}	coil diameter	m
$d_{channel}$	diameter of fixed bed	
d_{ct} or d_{sup}	coil support tube diameter	m
d_h	hydraulic diameter	m
d_i or d_t	inner tube diameter	m
d_p or $d_{particle}$	catalyst particle diameter	
D_{ax}	axial dispersion coefficient	m^2/s
D_m	mass diffusivity	m^2/s
De	Dean number	
$E(t)$	E -function	1/s
$E(\theta)$ or E_θ	dimensionless E -function	
$F(t)$	F -function or cumulative distribution function	
$F(\theta)$	dimensionless F -function	
L	channel length	m
L_{bed}	length of fixed bed	
L_{coil}	length of a single coil	
n_{bends}	number of bends	
p or p_{coil}	pitch distance between two turns	m
Pe_{ax}	axial Peclet number	
$Pe_{ax,p}$	axial particle Peclet number	
r	radius	m
r_c	radius of curvature	m
Re	Reynolds number	
Re_p	Particle Reynolds number	
S_{bed}	cross-sectional area of fixed bed	
Sc	Schmidt number	
t	time	s
$\bar{t}$	mean residence time	
$t_{D,ax}$	characteristic axial diffusion time	s
$t_{D,rad}$	characteristic radial diffusion time	s
u	fluid velocity	m/s
$\dot{V}_0$	inlet volumetric flow rate	m^3/s
Greek symbols	Definition	Units
ε	Bed porosity	

θ	dimensionless time	
μ	dynamic viscosity	Pa s
ν	kinematic viscosity	m ² /s
τ	space time	s
χ	geometric coefficient for Taylor-Aris correlation	
Abbreviation	Definition	
CFI	coiled flow inverter	
ID	internal diameter	
PTFE	polytetrafluoroethylene	
RTD	residence time distribution	