

Process Intensification and Green Chemistry – Notation and Symbolology

Chapter 7: Mixing in Microchannels

Roman symbol	Definition	Units	Comments
A	shape factor		function of shape parameter p
c	molar concentration	mol/m ³	
d or d_t	inner channel diameter	m	
d_h	Hydraulic diameter	m	
D or D_m	molecular or mass diffusivity	m ² /s	
H	Channel height	m	
L	total reactor length	m	
p	pressure	Pa	
p	shape parameter		0 for slab, 1 for cylinder, 2 for sphere
Δp	pressure drop	Pa	
Pe	Peclet number		
Q	volumetric flow rate	m ³ /s	
R	radius of channel	m	
R	half-thickness of aggregate	m	
Re	Reynolds number		
Sc	Schmidt number		
t	time	s	
t_{diff}	characteristic time for molecular diffusion	s	
$t_{diff+shear}$	characteristic time for diffusion in shear flow (engulfment regime)	s	
t_{mix}	characteristic mixing time	s	
u	velocity	m/s	
u_b	bulk velocity	m/s	
u_m	mean velocity	m/s	
u_{max}	maximum velocity	m/s	
V	channel volume	m ³	
W	Channel width	m	
Greek symbols	Definition	Units	Comments
$\dot{\gamma}$	shear rate	1/s	
$\dot{\gamma}_{max}$	maximum shear rate	1/s	
$\delta(t)$	lamellae thickness at time t	m	
δ_0	initial lamellae thickness	m	
ε	specific power dissipation	W/kg	
ξ	Geometric factor for pressure drop calculation		
η	energetic efficiency of mixing		

μ	dynamic viscosity	Pa s
ν	kinematic viscosity	m ² /s
ρ	specific gravity or density	kg/m ³