Nomenclature

d_0, d_1,d_3	optical system design distances, see Figure 2.6
cV-A	unit describing measured integrated chemiluminescence yield
λ	conductivity
ρ	density
A	area of reference for conduction through differential element
T	temperature
t	time
x	axial coordinate
c_p	average specific heat
$\dot{M}$	mass flow–rate
c_{p_k}	specific heat of species k
V_k	diffusion velocity of species k
Y_k	mass fraction of species k
W_k	molecular weight of species k
ω_k	reaction rate of species k
h_k	total enthalpy of species k at temperature T
Q'_{loss}	heat loss per unit axial length
A	pre–exponential factor
k_f	forward reaction rate
R_u	universal gas constant
E_a	reaction activation energy
β	reaction rate temperature exponent

X^*_{total}	total integrated yield of species X
$A_{Einstein}$	Einstein coefficient of excited species
$x_s tart$	axial starting location of integration domain
$x_e nd$	axial end location of integration domain
$[X^*]_{local}$	local concentration of excited species X
dx	differential axial distance
H	height of flame–cone for Bunsen flame model
R	flame base radius for Bunsen flame model
q_l"	heat–loss flux from flame in Bunsen flame model
y	height coordinate in the Bunsen flame model
ϕ_l	flame edge equivalence ratio in the Bunsen flame model
ϕ_o	nominal incoming mixture equivalence ratio in Bunsen flame model
b	Bunsen flame model mixture model parameter, see Section 7.3.1
h_{ch}	height beyond which $\phi = \phi_o$ in the Bunsen flame model
T_{flame}	flame temperature in Bunsen flame model
T_{rim}	Bunsen type burner rim temperature
d_{st}	Bunsen flame stand–off distance
T_{sink}	radiation sink temperature in Bunsen flame model
ϵ	flame emissivity in Bunsen flame model
$Q^{'}_{rad-loss}$	gas radiation heat–loss per unit length in honeycomb burner model
T_{gas}	gas temperature in honeycomb burner model
T_{hc}	honeycomb solid temperature in honeycomb burner model
P	perimeter of area A, as defined above
h_{conv}	convective heat transfer coefficient
$Q_{rad-loss}$	gas radiation heat–loss at honeycomb burner model boundary
$Q^{'}_{rad-in}$	honeycomb radiation heat–loss per unit length in honeycomb burner model
T_s	temperature of surroundings in radiation model
$cos(\theta)$	angle between differential lengths dl_1 and dl_2
dl_1, dl_2	differential lengths used in calculating radiation area factors
F_{12}	radiation area factor from area 1 to 2, area 2 is reference area

r	distance between differential lengths dl_1 and dl_2
a_p	mean Planck absorption coefficient
q'''	radiation per unit volume
A_{local}	local area with respect to radiation
$F_{local \to surf}$	local radiation area factor to the honeycomb surface
Δx	thickness of differential element
T_{local}	local gas temperature in calculation of radiation heat–loss
T_i	i-th honeycomb element temperature
$F_{local \to 0}$	local radiation area factor to the honeycomb exit area
$F_{0 \to i}$	area factor from the honeycomb exit area to the i-th honeycomb element
ϵ_{hc}	honeycomb emissivity
f	lens focal length
s_i	distance giving location of image behind lens
s_o	distance giving location of object in front of lens
F_{in}	fraction of light collected, refer to Figure C.3
θ_H, θ_L	calculation of fraction of light collected, refer to Figure C.3
L	radiation object height in optics calculations, refer to Figure C.3
NA_{lens}	lens numerical aperature
NA_{fiber}	fiber–optic numerical aperature
H_o	lens height
dl	differential length
θ_{H-i}, θ_{L-i}	calculation of fraction of light collected, refer to Figure C.3
θ_{H-a}, θ_{L-a}	calculation of fraction of light collected, refer to Figure C.3
F_{fin}	final fraction of light collected by fiber optic cable
s_{i-2}	distance giving location of image behind second lens
f_2	focal length of second lens
θ_{crit}	critical angle, steepest ray forming image after second lens
l	calculation of fraction of light collected, refer to Figure C.3
F_{incr}	fraction of light collected from incremental area A_{incr}
F_{tot}	total fraction of light collected from area A_{tot}

F_{old}	fraction of light collected from the area A_{old}
A_{incr}	incremental area, net object area increase
A_{tot}	total area of object
A_{old}	base area equal to A_{tot} - A_{incr}