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<td>ACE</td>
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LIST OF ABBREVIATIONS AND SYMBOLS (Cont’)

\( \text{C}_{20}\text{H}_{40}\text{O}_2 \)  Arachidic
\( \text{C}_{22}\text{H}_{42}\text{O}_2 \)  Erucic
\( \text{C}_{22}\text{H}_{44}\text{O}_2 \)  Behenic
\( \text{C}_{24}\text{H}_{48}\text{O}_2 \)  Lignoceric
CPOME  Mixed crude palm oil methyl Ester
[C]  The molar concentration of product C
c  Order of ester in reaction sequence
c  Order of product C
c  The coefficient of product C
cal  Calorie
cm\(^3\)  Cubic millimeter
cSt  Centistokes
D  The product
DG  Diglyceride
[D]  The molar concentration of product D
[DG]  The molar concentration of diglyceride
d  Order of product D
d  Order of water in reaction sequence
d  The coefficient of product D
E  Activation energy, J/mol or cal/mol
E  Ester
E\(_a\)  Activation Energies
EN  European test method
[E]  The molar concentration of ester
FAME  Fatty acid methyl ester
FFA  Free fatty acid
**LIST OF ABBREVIATIONS AND SYMBOLS (Cont’)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>[FFA]</td>
<td>The molar concentration of free fatty acid</td>
</tr>
<tr>
<td>f(x,y)</td>
<td>Function (x,y)</td>
</tr>
<tr>
<td>GC/FID</td>
<td>Gas chromatography/ flame ionization detector</td>
</tr>
<tr>
<td>GL</td>
<td>Glycerol</td>
</tr>
<tr>
<td>[GL]</td>
<td>The molar concentration of glycerol</td>
</tr>
<tr>
<td>g</td>
<td>Gram</td>
</tr>
<tr>
<td>H₂SO₄</td>
<td>Sulfuric acid</td>
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<tr>
<td>h</td>
<td>Width</td>
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<tr>
<td>I.V.P.</td>
<td>The initial value problem</td>
</tr>
<tr>
<td>i</td>
<td>Order</td>
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<tr>
<td>J</td>
<td>Joule</td>
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<tr>
<td>K</td>
<td>Kelvin</td>
</tr>
<tr>
<td>KOH</td>
<td>Potassium hydroxide</td>
</tr>
<tr>
<td>k_λ</td>
<td>The rate coefficient</td>
</tr>
<tr>
<td>k_a</td>
<td>The rate coefficient of the forward reaction</td>
</tr>
<tr>
<td>k⁻a</td>
<td>The rate coefficient of the reverse reaction</td>
</tr>
<tr>
<td>k₁</td>
<td>The rate coefficient of free fatty acid (forward reaction)</td>
</tr>
<tr>
<td>k₂</td>
<td>The rate coefficient of free fatty acid (reverse reaction)</td>
</tr>
<tr>
<td>k₃</td>
<td>The rate coefficient of TG (forward reaction)</td>
</tr>
<tr>
<td>k₄</td>
<td>The rate coefficient of TG (reverse reaction)</td>
</tr>
<tr>
<td>k₅</td>
<td>The rate coefficient of DG (forward reaction)</td>
</tr>
<tr>
<td>k₆</td>
<td>The rate coefficient of DG (reverse reaction)</td>
</tr>
<tr>
<td>k₇</td>
<td>The rate coefficient of MG (forward reaction)</td>
</tr>
<tr>
<td>k₈</td>
<td>The rate coefficient of MG (reverse reaction)</td>
</tr>
<tr>
<td>kg/m³</td>
<td>Kilogram/ cubic metre</td>
</tr>
<tr>
<td>k₁₁</td>
<td>The first step of the Runge–Kutta Method calculation</td>
</tr>
</tbody>
</table>
LIST OF ABBREVIATIONS AND SYMBOLS (Cont’)

k2 The second step of the Runge-Kutta Method calculation
k3 The third step of the Runge-Kutta Method calculation
k4 The fourth step of the Runge-Kutta Method calculation
L Liter
ln Natural logarithm
M Subinterval
MCPO Mixed crude palm oil
ME Methyl ester
ME1 Methyl ester from the first-stage process
MeOH Methanol
MG Monoglycerides
[MG] The concentration of monoglyceride
m The number of categories
mg/kg Milligram/ kilogram
mg KOH/g Milligram potassium hydroxide/ gram
min Minute
ml. Milliliter
NaOH Sodium hydroxide
N_{RE} Reynolds Number
n Number of population
n_i Sizes of categories
O.D.E Ordinary Differential Equation
ode23 Runge-Kutta Method order 2-3
ode45 Runge-Kutta Method order 4-5
prEN European test method
R Alkyl group
LIST OF ABBREVIATIONS AND SYMBOLS (Cont’)

R  Gas constant = 8.314 J/mol K or 1.987 cal/mol K
R  Short chain alkyl groups
RK4  The fourth–order Runge–Kutta Method
RPO  Refined palm oil
R²  The determination coefficient
R’  Alkyl group
R’  Long chain alkyl groups
R”  Alkyl group
R”  Long chain alkyl groups
R”O  Hydrocarbon group
R”’  Long chain alkyl groups
rpm  Revolutions per minute
T  Absolute temperature, K
T  Temperature
TLC/FID  Thin layer chromatography/ flame ionization detector
TG  Triglycerides
TSO  Tobacco seed oil
[TG]  The molar concentration of triglyceride
t  Time
WT  Water
[WT]  The molar concentration of water
xi  Population x
x_{i,j}  Data measurements
(x_i, y_i)  The discrete approximations
yi  Population y
° C  Degree Celsius
LIST OF ABBREVIATIONS AND SYMBOLS (Cont’)

\( \mu \)  Mean

\( \mu_i \)  Mean

\( \sigma \)  The standard deviation

\( \sigma_i \)  Standard deviation

\( \%v \)  \%volume by volume

\( \%v/v \)  \%volume by volume

\( \%vol \)  \%volume by volume

\( \%wt \)  \%weight by weight

\( \%wt/v \)  \%weight by volume

\( \%wt/wt \)  \%weight by weight