Known Errors and Typos in
"concepts of Modern Catalysis and Kinetics"
by
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We apologies for any inconvenience these errors and typos has caused.

Chapter 2
Page 26 eq. 8 should have read

$$r = k^+ [A]^{v_a} [B]^{v_b} - k^- [C]^{v_c} [D]^{v_d}$$

Page 30 line 11 from top equation should read
$$\Delta G^o = \Delta H^o - T\Delta S^o$$

Page 36 eq. 45 should read
$$k(T) = \nu e^{-E_a/RT}$$

Chapter 3
Page 94 eq. 66 should δ be replaced by ∂ so that it reads:

$$\mu_i = -k_B T \left[\frac{\partial \ln(Q_i)}{\partial N_i} \right] = -k_B T \left[\frac{\partial \ln\left(\frac{q_i^{N_i}}{N_i!}\right)}{\partial N_i} \right] \approx -k_B T \ln\left(\frac{q_i}{N_i}\right)$$

Page 96 same error as above so that eq. 76 reads:

$$\mu_i = -kT \left[\frac{\partial \ln(Q_i)}{\partial N_i} \right] = -k_B T \left[\frac{\partial \ln\left(\frac{q_i^{N_i}}{N_i!}\right)}{\partial N_i} \right] \approx -k_B T \ln\left(\frac{q_i}{N_i}\right)$$

Page 96-97 in eq. 76, 78, and 80 k should read k_B

And equation 81 should read $\dfrac{q^{trans}}{V} = \dfrac{(2\pi m_x k_B T)^{3/2}}{h^3}$

Page 99 in eq. 89-91: R should be replaced with k_B
Page 100 table 3.4 1 line $K_{H_2}(T)$ p_H/p_0 instead of $K_{H_2}H/p_0$ p_w/p_0

Chapter 5

Page 169 Figure 5.2 should look like this:

(100)   (110)   (111)
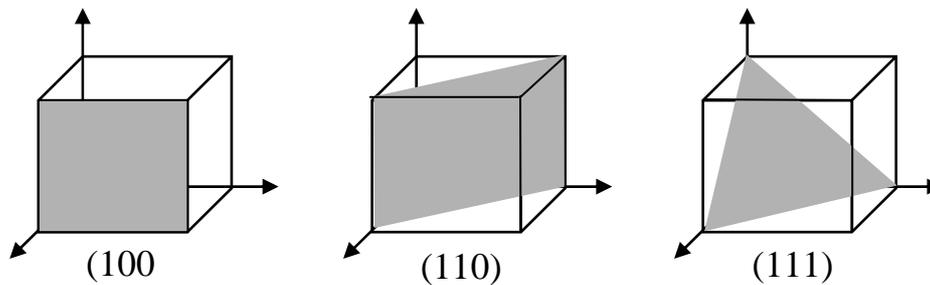
Page 173 8th line from bottom should refer to fig. 5.5 and not 5.6.

Page 180 1. line under figure 5.13 should read "The surface energy $\gamma(ijk)$ for each surface $\gamma(ijk)$...."

Page 181 Figure 5.15 Δh_i should replace Δh_j so it look like this
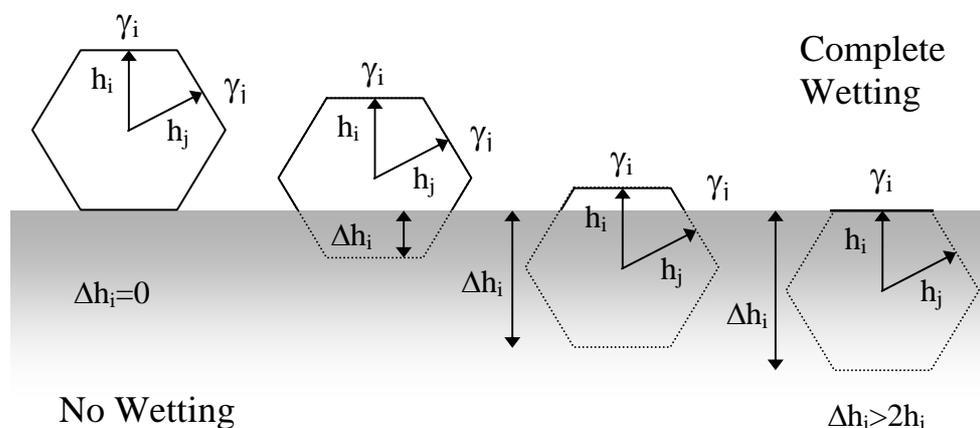
Page 185 eq. 10 should read $\theta_0 = \left[1 + \dfrac{k_2}{k_1} \dfrac{\left(\dfrac{F}{k_2}\right)}{1 - \left(\dfrac{F}{k_2}\right)} \right]^{-1}$

**Page 186 4th line** from top: $N_0 = PV_0/k_B T$ i.e. replace R with k_B

Page 204 item 4 should read:

4. Establish ideal flow patterns: This is usually assumed to be the case for plug-flow (PFR) and continuously stirred tank reactors (CSR), but are all conditions for ideal mixing fulfilled? For example, a rule of thumb is that the diameter d of the PFR should be at least 10 × the diameter d_p of the catalyst particles to eliminate the influence of the reactor wall. Also, the amount of catalyst should be sufficient to avoid axial gradients. Another rule is that the length of the bed L should be 50 × the particle diameter, i.e. $L > 50 d_p$. Higher values are preferable, but these may cause other problems such as temperature gradients and pressure drops.

Page 207 eq. 18 should read:

$$\text{rate} \left[\frac{\text{mol}}{\text{s}} \right] = V \left[m^3_{\text{cat}} \right] S \left[\frac{m^2_{\text{surfcat}}}{m^3_{\text{cat}}} \right] k \left[\frac{m^{3n}}{m^2_{\text{surfcat}} \ \text{mol}^{n-1} \ \text{s}} \right] C^n(r,t) \left[\frac{\text{mol}^n}{m^{3n}} \right] \quad (18)$$

Page 207 figure 5.33 should have looked like this:
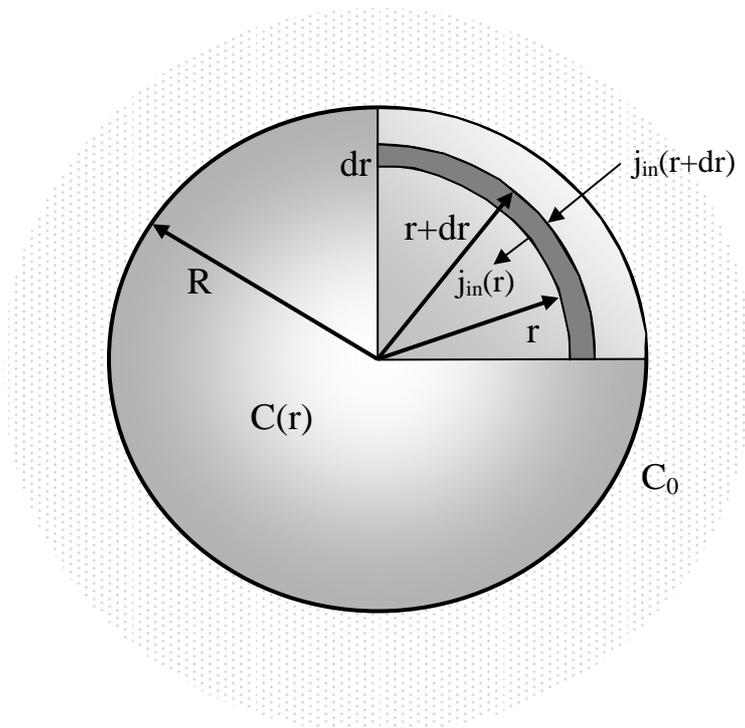
Page 209 eq. 28 should look like this $\quad \Phi_S = R\sqrt{\dfrac{Sk}{D_{\text{eff}}}} \qquad \omega \equiv \dfrac{\Phi_s}{R} = \sqrt{\dfrac{Sk}{D_{\text{eff}}}}$

Page 211 eq 36 and 38 should read

$$E^{\text{app}} = RT^2 \frac{\partial \ln(r)}{\partial T} = \Delta E_{\text{act}}$$

$$E^{\text{app}} = RT^2 \frac{\partial \ln(\text{Rate}_{\text{diff}})}{\partial T} = \frac{\Delta E_{\text{act}}}{2} + \frac{\Delta E_{\text{diff}}}{2} \approx \frac{\Delta E_{\text{act}}}{2} \quad \text{when} \quad \frac{\Delta E_{\text{diff}}}{2} \to 0$$

Page 213 ed. 46 should read

$$E^{\text{app}} = RT^2 \frac{\partial \ln(r_{\text{diff}})}{\partial T} = \frac{\Delta E_{\text{act}}}{2} + \frac{\Delta E_{\text{diff}}}{2} \approx \frac{\Delta E_{\text{act}}}{2} \quad \text{when} \quad \frac{\Delta E_{\text{diff}}}{2} \to 0$$

Page 212 eq. 42 last parenthesis should be deleted so it reads:

$$C(x) = C_0 \frac{\cosh\left[\omega(L-x)\right]}{\cosh(\omega L)} = C_0 \frac{\cosh\left[\Phi_s \dfrac{(L-x)}{L}\right]}{\cosh(\Phi_p)}$$

Chapter 6

Page 221 figure 6.5 miss a straight line so it should look like this:
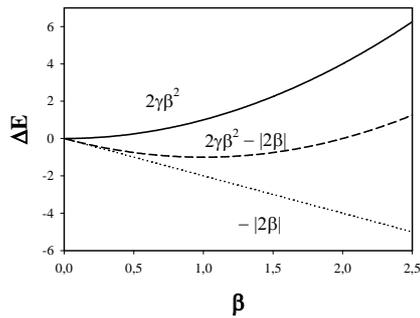
Page 236 eq. 53 middel replace $\int \Psi_a H \Psi_k \quad with \quad \int \Psi_k H \Psi_k$

Page 238 eq. 66, 67 and 71 should ε_a be replaced by ε_k. This has the consequence that the ε_a under the summation in eq 68, 69, and 71 should be relplaced by ε_k.

Page 238 The line in between eq. 66 and 67 should read:
allowing us to solve for G_{ka}:

Page 247 eq. 77 should read $\delta = (\varepsilon_a - \varepsilon_d) > 0$

Page 277 eq. 80 should read

$$E_{\text{d-hyb}} = -(1-f)\frac{2\beta^2}{\delta} + 2(1+f)\gamma\beta^2$$

$$= -(1-f)\frac{2\beta^2}{(\varepsilon_a - \varepsilon_d)} + 2(1+f)\gamma\beta^2$$

(80)

Page 251 eq. 85 in the 3th term $2(1+f)\gamma_{2\pi}\beta_{2\pi}^2$ should read $2(1+f)\gamma_{5\sigma}\beta_{5\sigma}^2$.

Chapter 7

Page 268 eq. 8 the term "lim *its*" should simply be removed twice.

Page 277 5th and 6th line from top the reference to Eq. (12) should be Eq. (14).

Page 278 figure 7.8 right axis should read like shown below
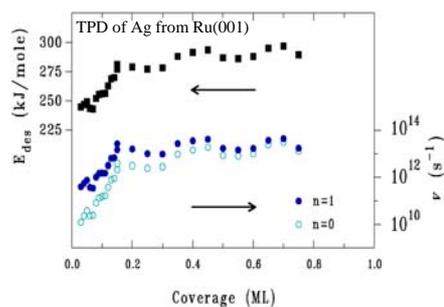
Page 291 eq 38 should read

$$\text{NH}_2* + \text{H}* \Longleftrightarrow \text{NH}_3* + * \quad \frac{d\theta_{\text{NH}_3}}{dt} = k_5^+ \theta_{\text{NH}_2}\theta_{\text{H}} - k_5^- \theta_{\text{NH}_3}\theta_* = 0 \Rightarrow \theta_{\text{NH}_2} = \frac{\theta_{\text{NH}_3}\theta_*}{K_5\theta_{\text{H}}}$$

And eq. 39 should read:

$$\text{NH}_3* \Longleftrightarrow \text{NH}_3 + * \quad \frac{d\theta_{\text{NH}_3}}{dt} = -k_6^+ \theta_{\text{NH}_3} + k_6^- P_{\text{NH}_3}\theta_* = 0 \Rightarrow \theta_{\text{NH}_3} = \frac{1}{K_6} P_{\text{NH}_3}\theta_*$$

Chapter 8

Page 340 electric power consumption was $4.6 \times 10^{19}\,\text{J year}^{-1}$ not $3.8 \times 10^{19}\,\text{J year}^{-1}$

Page 345 table 8.9 the density of lig. H_2 is 0.0708 not 0.078.

Questions and Exercises.

Page 417 eq.2 in exercise 2.10 should read: (2) $\text{CO} + * \Longleftrightarrow \text{CO}*$

Page 418 top second line should read: $S_0^{\text{H}_2} = S_0^{\text{CO}} = ...$

Page 418 elementary step 3 and 4 in exercise 2.11 should read

(3) $\text{CO}_2* + \text{H}* \Longleftrightarrow \text{HCOO}* + *$

(4) $\text{HCOO}* + \text{H}* \Longleftrightarrow \text{H}_2\text{COO}* + *$
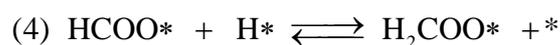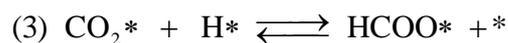
Page 429 question 4 in exercise 5.1 the standard conditions is at 298K not 273 as written.

Page 430 second last line of exercise 5.2 replace reproduce with reduce.

Page 431 6th line should start with 7)

Page 432 2. line from top should read M_W=58.71g.

Page 432 in 7.th line dosage of 0.2 bar s.

Page 432 the x-axis should be in units of bar*sec not torr*sec

Page 437 line 2 $NO* + * \rightarrow N* + O* \quad RLS$

Page 437 line 6 $N* + N* \in N_2* + *$

Page 440 Eq. 3 $O_2* + H* \rightarrow HO_2* + * \quad RLS$

Appendix A

Page 443 line 9 Electron mass $m_e = 9.110*10^{-31} kg$

Page 443 line 16 Vacuum Permitivity 8.854x10^{-12}Cm^{-1}V^{-1}

Page 444 2. line 1 bar =0.98692atm=750.06 mmHg=100000Pa=100000kgm^{-1}s^{-2}