

**Errata Sheet**  
(December 2020)

**Fundamentals of Radiation Materials Science: Metals and Alloys, 2<sup>nd</sup> Edition**

<u>Page</u>	<u>Location</u>	<u>Description</u>
<b>Chapter 1</b>		
8	First Eq. in Example 1	Change “ $\sin(\pi-\theta)$ ” to “ $\sin(\pi-\phi)$ ”.
12	First Eq. in Section 1.1.2	“- $Q$ ” should be “ $Q$ ”
14	Eq. (1.31)	There should be no “,” between “ $E_i$ ” and “ $E'_m$ ”, two places
17	Line above Eq. (1.43)	“ $T_g$ ” should be “ $T_\gamma$ ”.
37	4 <sup>th</sup> line below Eq. (1.102)	Replace “and” after “ $\phi \rightarrow 0$ ” with “,”
38	first line	Insert “.” between “ $a$ ” and “But”.
48-40	Eq. (1.133) through to Eq. (1.134)	Replace “ $c$ ” with “ $C$ ”.
55	Eq. (1.170)	$E_i$ is in units of keV.
58	Eq. (1.178)	Should read $NS'_e(E) = \left(-\frac{dE}{dx}\right)_e = k'E^{1/2}$
61	Table 1.7	Electronic energy loss rate of $kE^{1/2}$ (Eq. (1.190)) and the definition of $k$ belong in the same box.
67	line 2 below Eq. (1.21)	“ $N_p \sim 4 \times 10^{20}$ atoms/cm <sup>2</sup> ” should be “ $N_p \sim 4 \times 10^{20}$ atoms/cm <sup>3</sup> ”
73	Problem 1.8	Part (a) should read “ $E_T$ , the total kinetic energy of the system”. Part (c) should read “ $E$ , the energy in the CM system available for transformation”.
<b>Chapter 2</b>		
81	Eq. (2.17)	Should $C = \frac{1}{2E_d}$ read
85	Three lines from bottom	Change “<110>” to “<100>”.
86	Line 6	Change “<110>” to “<111>”.
98	Line above Eq. (2.69)	Replace “ $\leq$ ” with “ $\geq$ ” in equation.
	Line above Eq. (2.70)	Eq. for $V(r)$ should read $V(r) = A \exp(-r/B)$ .
99	Eq. (2.75) and below	Replace “ $E_f$ ” with “ $E_{fc}$ ” in Eq. (2.70) and in lines 5 and 7 following.
100	Eq. (2.78)	In term in numerator in the 2 <sup>nd</sup> Eq. should be “ $\ln(T/E_{fc})$ ”.
	Eq. (2.79)	In term in denominator should be “ $\ln(E_{fc}/2A)$ ”.
	Eq. (2.80)	$P_f(T) = \frac{n \ln(T / E_{fc})}{2 \ln(E_{fc} / 2A)}$

- 109 Line below Eq. (2.103) Change Eq. reference to “Eq. (2.101)”  
 129 Problem 2.14, line 4 Change “0 361” to “0.361”

## Chapter 4

- 177 First line below Eq. (4.8) Change “Planck’s constant” to “the reduced Planck’s constant”.
- 181 Eqs. (4.26-4.27) For Eq. above (4.26) and for Eqs. (4.26) and (4.27), remove the “-“ sign (in 4 places).
- 191 Eq. (4.53) There should be no “-“ sign in the  $\left(\frac{\Delta S_m}{k}\right)$  term.
- 193 Line after Eq. (4.59) Change to “where  $D_0 = \alpha a^2 v \exp\left(\frac{S_m}{k}\right)$ ”.
- 194 Table 4.2 For bcc lattice, change A for Vacancy and Vacancy self-diffusion to “ $\sqrt{3}/2$ ”.
- 194 Example 4.3, line 7 Change “For the fcc lattice  $z=12$ ,  $A = 1/\sqrt{2}$ , and  $a \sim 0.3$  nm giving” to “For the fcc lattice,  $a \sim 0.3$  nm and for vacancies  $z = 12$ ,  $A = 1/\sqrt{2}$ , and for interstitials  $z = 8$ ,  $A = 1/2$ .”  
 Change to “ $D_v \simeq 5 \times 10^{-8}$  cm<sup>2</sup>/s”  
 “ $D_i \simeq 7 \times 10^{-4}$  cm<sup>2</sup>/s”  
 “ $D_a^v \simeq 3 \times 10^{-15}$  cm<sup>2</sup>/s”  
 “ $D_i^v \simeq 3 \times 10^{-18}$  cm<sup>2</sup>/s”

## Chapter 5

- 216 Eq. (5.29) second equality Change to “ $C_i^{ss} = \dots$ ”
- 218 Caption Figure 5.5 Insert “defect” after “high” in the first line.
- 235 Eq. (5.73) Change “ $\mathcal{R}$ ” in brackets to be raised to the power 3:  

$$C(r) = C_R + \frac{K_0}{6D} \left[ \frac{2\mathcal{R}^3(r-R)}{rR} - (r^2 - R^2) \right].$$
- 237 First line Replace “ $R_d$ ” with “ $\mathcal{R}$ ”.
- 239 Third line Change “series” to “parallel”.
- 239 Eq. (5.104) Font size of the term  $\frac{1}{z_d}$  in the Eq. for  $k_{\text{eff}}^2$  should be larger.
- 243 Table 5.2, column 3 In last line, Eq. on right: Change subscript on  $k^2$  to be same as subscript on  $K$  in Eq. on right in column 2, last line.

## Chapter 6

263	Eq. (6.32)	Change $d_{Ai}$ in the numerator to $d_{Bv}$
293	5 <sup>th</sup> line below Eq (6.74)	Change “sties” to “sites”.
297	Problem 6.2 (c)	Change text to read “...coefficient of chromium by way of vacancies...”

## Chapter 7

313	Eq. (7.13)	Eqn for $u_x$ : Numerator of the second term in brackets should be “ $\lambda + \mu'$ ”.
314	Eq. (7.15)	Remove “-“ sign on $\sigma_{xy}$ term.
316	line 2 below Eq. (7.23)	Change to “ $\nu \sim 0.3$ ”.
331	line 5	Insert space between “actually” and “a”.
347	Eq. (7.66)	Change: $E_p = \frac{2}{3} \frac{1}{(1-\nu)} + \frac{1}{3} \left( \frac{2-\nu}{2(1-\nu)} \right) \mu b^2 r_L \ln \left[ \frac{4r_L}{r_c} - 2 \right]$ , to $E_p = \left\{ \frac{2}{3} \frac{1}{(1-\nu)} + \frac{1}{3} \left( \frac{2-\nu}{2(1-\nu)} \right) \right\} \mu b^2 r_L \ln \left[ \frac{4r_L}{r_c} - 2 \right]$
351	Eq. (7.70)	Change “ $\sigma_v(n+1)$ ” to “ $\alpha_v(n+1)$ ”.
325	Eq. (7.50)	First term on RHS, “ $\mu'$ ” in denominator should be “ $\pi$ ”. Sign on second term should be “+”, not “-“.
348	line 4	“ $1/3 T/T_m$ ” should read “ $\frac{1}{3} T/T_m$ ”.
377	line 3 of Problem 7.13	Change to “ $\mathbf{b} = b[\sqrt{2} \sqrt{2} \ 0]$ ”.
377	Problem 7.14	Add “(2)” after “dislocation in part (b).”

## Chapter 8

386	Fig. 8.4	“ $\alpha_v$ ” at top of figure should be “ $\alpha_i$ ”
392	Fig. 8.8	Label “ $J = 10^{12}$ ” should be in orange color to go with the orange curve above it.
394	First line after Eq. (8.46)	Insert “and Eq. (8.43)” after “Eq. (8.42)”.
411	Eq. (8.116)	Last term in bracket in 2 <sup>nd</sup> Eq. should be $\frac{(k_v^2)^2 D_v^2}{4K_{iv}}$ .
413	Eq. (8.130)	First “ $\rho_v$ ” in numerator should be “ $\rho_v$ ”. Denominator should be multiplied by “ $\rho_d$ ”.
433	1 <sup>ST</sup> line under Eq. (8.175)	“ $z_i$ ” should be “ $z_1$ ”.
451	Fig. 8.42	Curve in blue in middle panel (593°C) should be labeled “12.1 Ni”
466	Eq. (8.227)	In both equations, “ $n$ ” in the numerator should be “ $\pi$ ”.
482	Problem 8.12	RHS of the equation should be “ $\sqrt{2}$ ”.

## Chapter 9

492 first line below Eq. (9.10) “ $r_0$ ” should be “ $\bar{r}_0$ ”.  
 544 definition of  $\delta$ , last line definition for  $\delta$  should include “shell thickness in recoil dissolution model”.

### Chapter 11

664 Problem 11.4 (b) “ $E_f^m = 1.9\text{eV}$ ” should be “ $E_f^v = 1.9\text{eV}$ ”.

### Chapter 13

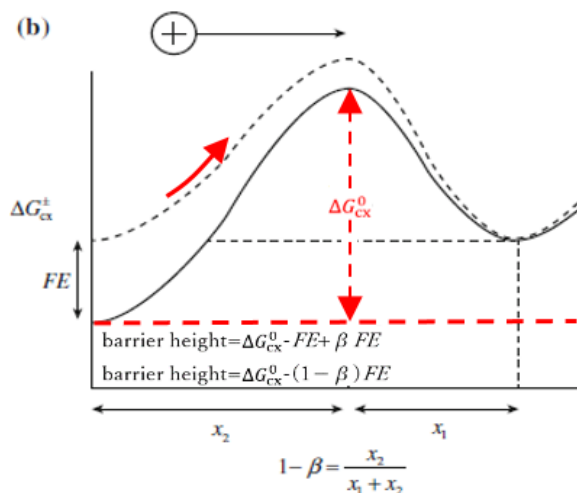
752 Line above Eq. (13.62) Change “ $p_2 = p_3 = 0$ ” to “ $\sigma_2 = \sigma_3 = 0$ ”.

### Chapter 14

800 Eq. (14.25) In Eqs. for  $\sigma_{xx}$  and  $\sigma_{yy}$ , change “ $\cos 3\theta/2$ ” to “ $\sin 3\theta/2$ ”.  
 802 Eq. (14.26) In Eqs. for  $\sigma_{xx}$  and  $\sigma_{yy}$ , change “ $\cos 3\theta/2$ ” to “ $\sin 3\theta/2$ ”.

### Chapter 15

863 2 lines below Eq. 15.10 Change “inside of the phase,  $E_x$ , and is the Galvani” to “inside of the phase, and  $E_x$  is the Galvani”  
 879 Eq. 15.28 Replace first “+” with “=”  
 880 Fig. 15.9 Delete “  $\leftarrow \beta \rightarrow$  ” at top of figure.  
 881 Caption to Fig. 15.10 Remove “(c)” at end of the caption.  
 3 lines above Eq. 15.32 Change “Figure 15.11(a)” to “Figure 15.12(a)”.  
 6 lines below Fig. 15.10 Change “metal.” to “metal, Fig. 15.11.”  
 883 Fig. 15.12 (b) Replace Fig. 15.12 (b) with the following:

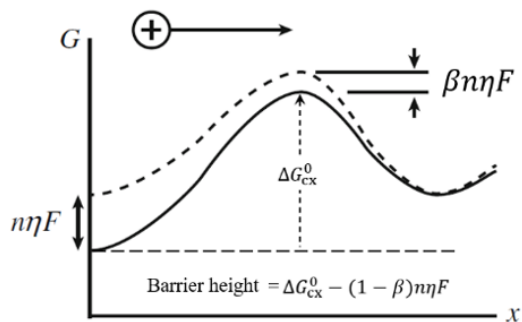


886 Caption to Fig. 15.14

890 Fig. 15.17(a)

Change end of caption to read "...rectification effect *for a...*"

Replace the right-hand side figure with the following:



892 4 lines below Fig. 15.21

897 2 lines below Eq. 15.54

907 3 lines from bottom of page

913 Caption to Fig. 15.47

929 2<sup>nd</sup> line from bottom of page

936 8 lines above bottom of page

943 2<sup>nd</sup> line from bottom of page

Insert "=" before " $10^{-3} \text{ A/cm}^2$ ".

Replace " $|I_A| > |I_C|$  is greater" with " $|i_A| > |i_C|$ ".

Replace "Fig. 15.3(b)" with "Fig. 15.39(b)".

Delete "Fontana 10.5 and 10.6".

Insert "energy" after "low stacking fault".

Delete "and".

Replace "Electrochemical" with "Chemical".