ERRATA

Core Concepts for a Course on Materials Chemistry

Page 16   *Figure 1.15 should be:*

(a)

Phase

$\sin (0) = \sin (n\pi) = 0$
$\sin ([n+1/2]\,\pi) = +1$ (n even)
$= -1$ (n odd)

0   π 2π

0   $\lambda/2$ λ

Displacement

(b)

amplitude = **A**   amplitude = **2A**

$$Total\ wave = A\left\{ sin\left(\frac{2\pi x}{\lambda}\right) + sin\left(\frac{2\pi\left(x+\frac{\lambda}{4}\right)}{\lambda}\right)\right\}$$
$$= A\left\{ sin\left(\frac{2\pi x}{\lambda}\right) + sin\left(\frac{2\pi x}{\lambda}+\frac{\pi}{2}\right)\right\}$$
$$= A\left\{ sin\left(\frac{2\pi x}{\lambda}\right) + cos\left(\frac{2\pi x}{\lambda}\right)\right\}$$

At maximum,
$$\frac{\partial}{\partial x}\left[A\left\{ sin\left(\frac{2\pi x}{\lambda}\right) + cos\left(\frac{2\pi x}{\lambda}\right)\right\}\right] = 0$$
$$\Rightarrow \frac{2\pi}{\lambda}\left\{ cos\left(\frac{2\pi x}{\lambda}\right) - sin\left(\frac{2\pi x}{\lambda}\right)\right\} = 0 \qquad \Rightarrow \frac{2\pi x}{\lambda} = \frac{\pi}{4}$$

the amplitude is : $A\left\{ sin\left(\frac{\pi}{4}\right) + cos\left(\frac{\pi}{4}\right)\right\} = 1.4A$

(c) $\lambda/4$

amplitude = **A**   amplitude = **1.4A**

(d) $\lambda/2$

amplitude = **A**   amplitude = **0**

(e)

x ⟶ 1

$x + \lambda/2$ ⟶ 2

$x + \lambda$ ⟶ 3

Waves 1 and 2 interfere destructively
Waves 1 and 3 interfere constructively
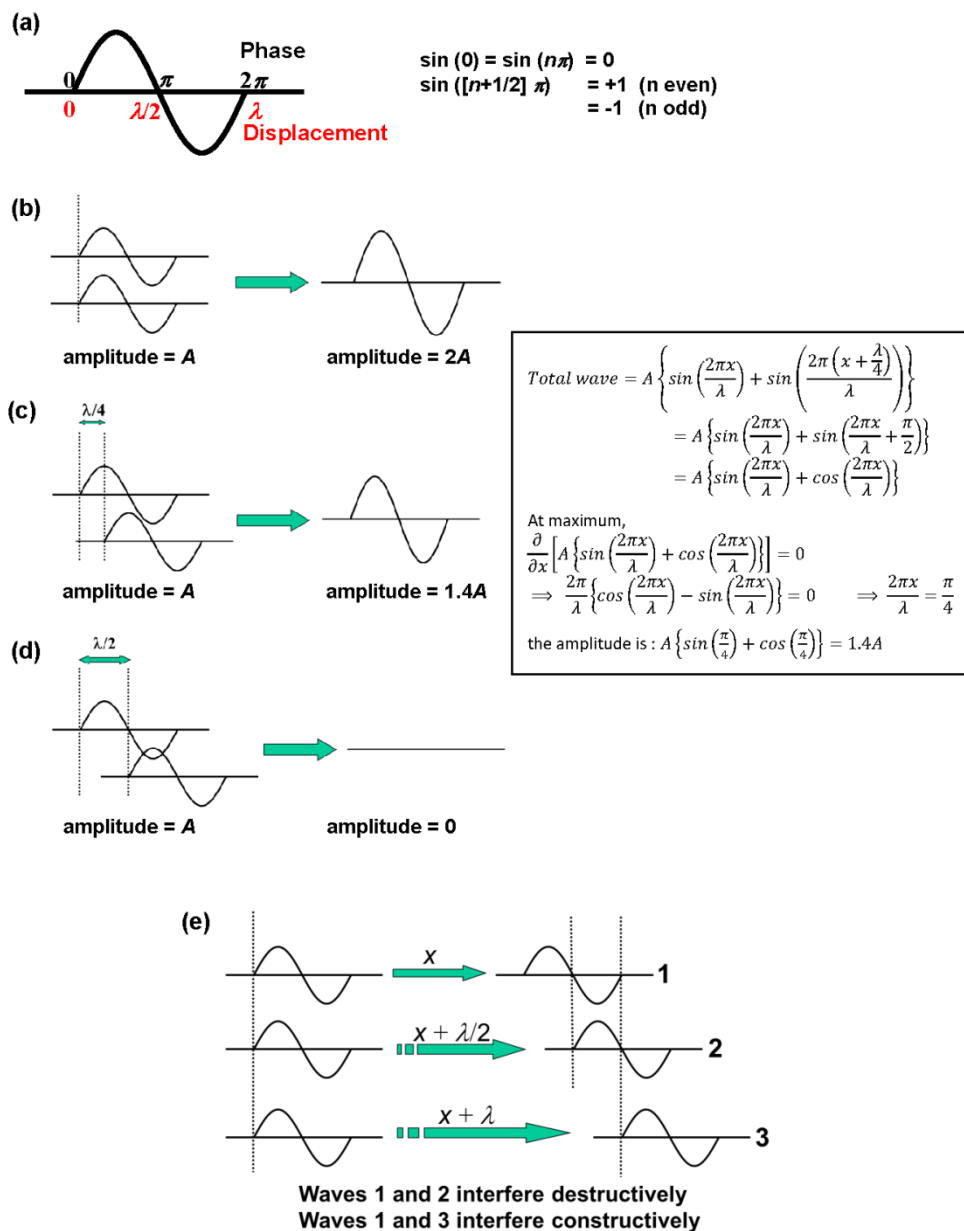
Page 40   *In Section 2.3.2, the first bullet point should be:*

- A well-known example is Ca^{2+} impurity in a K^+Cl^- crystal. One Ca^{2+} replaces two K^+ in order to maintain overall charge neutrality.

Page 54	*Caption of Figure 3.6(b) should be:*
(b) Bose-Einstein distribution function; excitation of phonons with different frequencies at temperature, *T* are shown schematically. Drawn schematically based on Figures 4.3 and 4.4 in ref. 1.

Page 55	*First line should be:*
- It is seen from Figure 3.6(b) that for a temperature, *T*, ω_1 mode is

Page 76	*The first word in the third line of the second bullet point should be:*
vector,

Page 78	*In Section 4.2.3, in the second bullet point, in the parenthesis, it should be:*
$$k = s\left(\frac{2\pi}{na}\right)$$

Page 82	*The third bullet point in Section 4.3.1 should be:*
- At very low temperatures where the phonons die down fully (phonon numbers vanish even for the lowest energy acoustic modes), the carrier scattering is only due to lattice impurities and defects, and the mobility becomes constant; the corresponding resistivity is ρ_1 (see Section 4.1.5; shown as ρ_{res} in Figure 4.13(b)).

Page 103	*In Table 4.5, entry in the third column of the 21st example should be:*
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Page 117	*In Section 5.3.1, the equation under the first bullet point should be:*
$$U = -\boldsymbol{\mu}.\boldsymbol{H} = m_J g\beta H$$

Page 121	*The fourth line from the top should be:*
of the field. $\chi_{Landau} \sim -\frac{1}{3}\chi_{Pauli}$.

Page 150	*In Section 6.2.1, the last two lines under the first bullet point should be:*
light irradiation; for example, CdS commonly used in pho-
toresistors has a $\frac{\sigma_{ph}}{\sigma_{dark}} \sim 10^5 - 10^6$.

Page 163	*The last line in the first paragraph should be:*
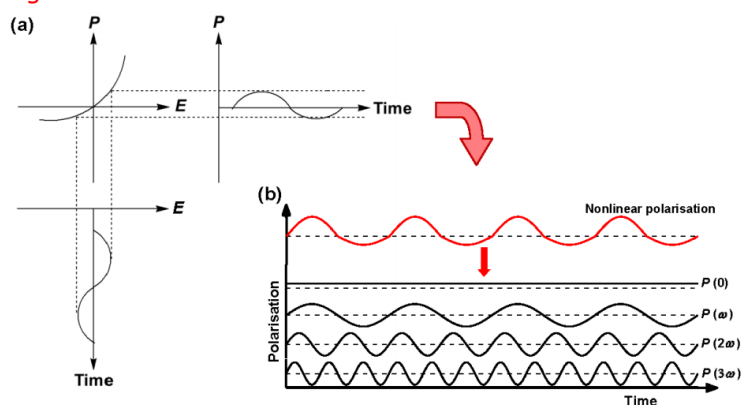LEDs (Section 6.3.3).

Page 169   *Figure 6.18 should be:*

Page 178   *Figure 7.1 should be:*

Page 182   *Figure 7.5 should be:*

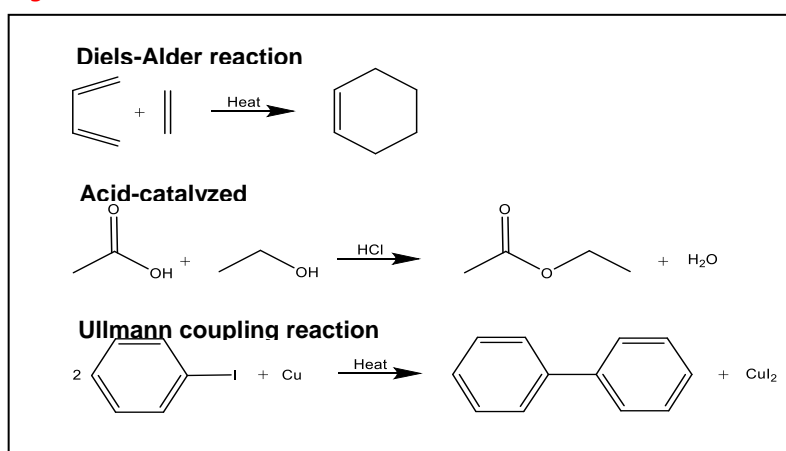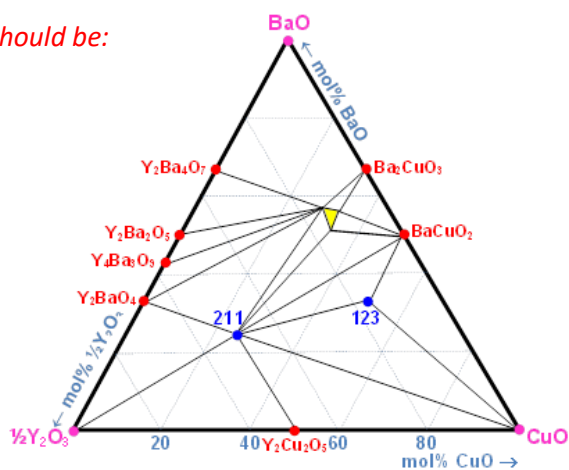**Page 227**   *Question B-5 should be:*

5.   Given the equation for the geometric structure factor,
$S_{hkl} = \sum_n f_n e^{2\pi i(hx_n + ky_n + lz_n)}$, derive the systematic absence conditions for a face-centered cubic lattice.

Page 244   *In the Subject Index:* **'Frätzel cell'** *should be corrected to 'Grätzel cell' and placed at the appropriate point in the index.*