

**Surface Science: Foundations of Catalysis and Nanoscience**  
**List of corrections to 2<sup>nd</sup> Edition**

Many of these corrections have been made in the second printing of the 2<sup>nd</sup> Edition.

**Acknowledgements**

"for his studies of chemical processes on solid surfaces" ...

I would particularly like to acknowledge ... Brigitte Vögele ... for providing original figures. The heroic efforts of Yukio Ogata in securing the *sumi nagashi*....

Czesław Miłosz

Errors in the second edition were pointed out by Qixiu Li.

**Chapter 1**

p. 20 Should read

"The International Union of Pure and Applied Chemistry (IUPAC) recommendations {\*} define samples with free diameters <2 nm as microporous, between 2 and 50 nm as mesoporous, and >50 nm as macroporous."

{\*} L. B. McCusker, F. Liebau, G. Engelhardt, Pure Appl. Chem. **73** (2001) 381-394.

p. 52. In Exercise 1.4 it should say "Use the value of the Fermi energy given in Exercise 1.2".

**Chapter 2**

p. 87. Fig. 2.14 should be rotated clockwise by 90°.

**Chapter 3**

p. 139. Fig. 3.7 should be rotated clockwise by 90°. Also the letter  $\sigma$  appears as a 0, as in  $3\sigma E = -1.5210$ ,  $4\sigma E = -0.8038$ ,  $5\sigma E = -0.5544$ , and  $6\sigma E = 0.2755$

p. 200. In Exercise 3.22

(or do not stick on the first bounce)

**Chapter 4**

p. 213 immediately below Eq. (4.2.1) it should read:

where  $Q_{\text{ads}}$  is

On p. 230, Eq. (4.62) is referenced twice rather than Eq. (4.5.6)

Comparing this result to our CTST result in Eq. (4.5.6)...

At  $\theta = 0$ , Eq. (4.5.6) reduces to

p. 231. In Eq. (4.5.17), should read

$$\begin{aligned} s &= s_0(1 - 2\theta) \text{ for } \theta < 0.5 \\ s &= 0 \quad \text{for } \theta \geq 0.5 \end{aligned} \tag{4.5.17}$$

On p. 236, Equation (4.6.8) should read

$$\frac{1}{\sigma} - \frac{1}{\sigma_0} \approx \frac{1}{\sigma} = \frac{1}{bp} \quad \therefore \sigma = bp \quad (4.6.8)$$

p. 238

Temperature programmed desorption<sup>17, 57-60</sup>

## Chapter 5

p. 270. The figure caption and discussion do not make it completely clear that  $r$  is the radius of the meniscus (the effective radius of the bubble) and that  $r_c$  is the pore radius at the top of the meniscus. In the case of a hydrophilic surface with  $\psi = 0^\circ$ , these two are equal. The figure caption should read.

Fig. 5.7 (a) A conical pore with a hydrophilic surface induces the condensation of water and the condensation radius  $r_c$  (i.e. the width of the pore at the point where the meniscus forms) is equal to the effective radius  $r$  of the "bubble" of condensed liquid that forms the meniscus. (b) Capillary condensation in a pore with a partially wetting surface, in which case the bubble has a greater radius than the pore radius where condensation occurs,  $r > r_c$ . (c) A cylindrical pore with a width  $r_1$  significantly smaller than the length,  $r_2$ . (d) An illustration of meniscus formation in the presence of two spherical particles of radius  $R_p$

p. 292. In problem 5.8 it should read

Si(111)-(1×1) layer

p. 293. Problem 5.15 should read

5.15 Calculate the effective pressure due to capillary forces and the critical film thickness for a porous silicon film with a porosity  $\varepsilon = 0.90$  when dried in air after rinsing in water or ethanol. The mean pore radius is  $r_p = 5$  nm.  $\gamma_{\text{EtOH}} = 22.75$  mN m<sup>-1</sup>,  $\gamma_{\text{water}} = 71.99$  mN m<sup>-1</sup>,  $\gamma_{\text{Si}} = 1000$  mN m<sup>-1</sup>,  $E_{\text{Si}} = 1.62 \times 10^{11}$  N m<sup>-2</sup>.

## Chapter 6

p. 310. Eq. (6.4.26) should read

$$K_7 = \frac{(\theta_{H^*})^2}{(p_{H_2} / p_0)(\theta_*)^2} \quad (6.4.26)$$

p. 316. Fig. 6.7 should be rotated clockwise by 90°.

p. 331. Eq. (6.14.2) should read

$$\theta_{N^*} = \frac{p_{\text{NH}_3} p_0^{0.5}}{K_3 K_4 K_5 K_6 K_7^{0.5} p_{\text{H}_2}^{1.5}} \theta_* \quad (6.14.2)$$

p. 329 "intermediately strong interactions"

## Chapter 8

p. 404, not really a mistake but the typography looks a bit confusing so better would be to put the factors in as fractions:

"with a mean energy  $E_F + \frac{1}{3}\delta E$ . They go on to collide with two more electrons near  $E_F$  to form four electrons at  $E_F + \frac{1}{9}\delta E$ , etc."

p. 448. In Exercise 8.3, Eq. (8.9.4) it should be  $I_{\text{den}}$  as in

$$I_{\text{den}}(t) dt = a_d \frac{L^4}{t^4} \exp(-b(L/t)^2) dt \quad (8.9.4)$$

p. 449. In Exercise 8.10, the final state contains a  $5\sigma^{-1}$  term and should read:

8.10 Consider a CO molecule adsorbed on a metal surface such that its  $5\sigma$  state lies far below  $E_F$ , its  $2\pi^*$  state is very close to but slightly above  $E_F$  and the  $6\sigma^*$  state lies far above  $E_F$ . Describe the electron dynamics that lead to two different  $5\sigma^{-1}$  state after absorption by the adsorbed CO of a photon with an energy that is resonant with the  $5\sigma \rightarrow 6\sigma^*$  transition.

p. 450 In Exercise 8.17, it should read: Eq. (8.4.11).

p. 451. The overpotential is defined with a switched sign, and should read:

(b) If the Gibbs energy of activation depends on the **overpotential**  $\eta = U_0 - U$

In some of the hardbound editions, Exercise 8.18 and 8.19 as well as the references to Ch 8 and Appendix I do not appear.