

Correction to: Quadrupole Contributions from Interface and Bulk

Correction to Chapter 7 in: A. Morita, *Theory of Sum Frequency Generation Spectroscopy*, Lecture Notes in Chemistry 97, <https://doi.org/10.1007/978-981-13-1607-4>

The original version of this book was inadvertently published with errors. The corrections listed below are incorporated after publication

- 1) p. 158, Eq. (7.21)

$$Q_{0,sp}^{(2)} \rightarrow Q_{0,ps}^{(2)}$$

- 2) p. 158, next line below Eq. (7.21)

$$-\frac{\partial}{\partial S} Q_{0,sp}^{(2)} \rightarrow -\frac{\partial}{\partial S} Q_{0,ps}^{(2)}$$

- 3) p. 173, Eq. (7.69)

$$q_{sp}(\Omega) \rightarrow q_{ps}(\Omega)$$

$$E_q(\omega_2) \rightarrow E_q(\omega_1)$$

- 4) p. 173, Footnote 4 is added.

unless otherwise noted. \rightarrow unless otherwise noted.⁴

⁴ Note that the gradient of the generalized quadrupole moment $-\sum_q \partial_q q_{pq}(\omega)$ gives rise to the polarization, as we have mentioned in relation to Eq. (7.21). The current \mathbf{J} is related to the multipole moments by

$$\begin{aligned} J_p &= \left[\frac{d}{dt} (\boldsymbol{\mu} - \nabla \cdot \mathbf{q}^E) + c \nabla \times \boldsymbol{\mu}^M + \dots \right]_p = -i\omega \left(\mu_p - \sum_q \partial_q q_{pq}^E \right) + c \sum_{q,r} \varepsilon_{pqr} \partial_q \mu_r^M + \dots \\ &= -i\omega \left(\mu_p - \sum_q \partial_q q_{pq}(\omega) \right) \end{aligned}$$

where we assumed the phase factor of $\exp(-i\omega t)$ (see Eq. (1.3)).

5) p. 176, Eq. (7.81)

$$q_{sp} \rightarrow q_{ps} \text{ (4 terms)}$$

6) p. 178, Eq. (7.87)

$$q_{sp} \rightarrow q_{ps} \text{ (4 terms)}$$

7) p. 178, Eq. (7.90)

$$\beta_{rpq}' \rightarrow \beta_{rqp}' \text{ (2 terms)}$$

8) p. 180, Eq. (7.100)

$$q_{sp} \rightarrow q_{ps} \text{ (2 terms)}$$

9) p. 181, Eq. (7.104)

$$\beta_{spq} \rightarrow \beta_{psq} \text{ (2 terms)}$$

10) p. 181, Eq. (7.108)

$$\beta_{spq} \rightarrow \beta_{psq} \text{ (2 terms)}$$

11) p. 182, Eq. (7.112)

$$\beta_{spq} \rightarrow \beta_{psq} \text{ (1 term)}$$

12) p. 183, Footnote number changes. 4 → 5

13) p. 194, Footnote 6 is added.

Here we explain its origin and physical meaning in an illustrative manner. → manner.⁶

⁶ χ^{IQB} could be interpreted as the contribution of electric quadrupole and magnetic dipole radiation. Here we present a heuristic explanation.

14) p. 195

$$\lim_{x \rightarrow -1+0} \frac{\mu}{1+x} \rightarrow \lim_{x \rightarrow -1+0} \frac{\mu}{1-x}$$

15) p. 196, Footnote number changes. 5 → 7

The updated original version of this chapter can be found at https://doi.org/10.1007/978-981-13-1607-4_7