THE JOURNAL OF PHYSICAL CHEMISTRY C

Addition/Correction

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Correction to "Effect of Nonelectrostatic Ion Interactions on Surface Forces Involving Ion Adsorption Equilibria"

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J. Phys. Chem. C **2013**, *117* (32), 16416−16428. DOI: 10.1021/jp404086u

Our manuscript "Effect of Nonelectrostatic Ion Interactions on Surface Forces Involving Ion Adsorption Equilibria" addressed the free energy and effect on surface forces due to ion site binding (charge regulation, chemisorption) under conditions where ions experience nonelectrostatic interactions with surfaces.

In Table 1 we presented expressions for the chemisorption free energy of acidic/basic and amphoteric sites. The amphoteric chemisorption free energy was given as $-\psi_0\sigma_0 - \Delta\mu_{ps}^{NES}\sigma_0/q + k_BTN\ln(1 - \sigma_0/\sigma_{max}) - k_BTN\ln(2K_-/H_s + 1) + k_BTN\ln(1 + D/K_+ + K_-/D)$, where H_s is the activity of the hydrogen ion in solution at the surface, K_- is the dissociation constant for first protonation of the bare site ($SH \rightarrow S^- + H^+$), and K_+ is the dissociation constant for second protonation ($SH_2^+ \rightarrow SH + H^+$). Here $D = (K_-K_+)^{1/2}$ (taking $f = 1$ for the amphoteric case).

The ratio in the term $\ln(2K_-/H_s + 1)$ was incorrect and should be replaced with $\ln(2H_s/K_+ + 1)$. The correct chemisorption free energy for an amphoteric site is

$$F_{cs}[\text{amphoteric}] = -\psi_0\sigma_0 - \Delta\mu_{ps}^{NES}\sigma_0/q + k_BTN\ln(1 - \sigma_0/\sigma_{max}) - k_BTN\ln(2H_s/K_+ + 1) + k_BTN\ln\left(1 + \frac{D}{K_+} + \frac{K_-}{D}\right) \quad (1)$$

This expression agrees with the amphoteric free energy derived by Chan[1] when the nonelectrostatic interaction is neglected ($\Delta\mu_{ps}^{NES} = 0$).

REFERENCES

(1) Chan, D. Y. C. *Free Energies of Electric Double Layers at the Oxide-Solution Interface*; ACS Symposium Series: Geochemical Processes at Mineral Surfaces; American Chemical Society: Washington, DC, 1986; Vol. *323*; Chapter 6, pp 99−112.

Published: August 27, 2014