

ADDITIONS AND CORRECTIONS

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Qiang Wang, Takashi Taniguchi, and Glenn H. Fredrickson*: Self-Consistent Field Theory of Polyelectrolyte Systems

Page 6733. In our recent paper on self-consistent field (SCF) theory of polyelectrolyte systems,¹ a position-dependent dielectric constant (denoted by $\epsilon(\mathbf{r})$) was used to account for the large difference between the dielectric constants of pure polymer of type P and pure solvent S (denoted by ϵ_P and ϵ_S , respectively), which is approximated as

$$\epsilon(\mathbf{r}) = \sum_P \epsilon_P \phi_P(\mathbf{r}) + \epsilon_S \phi_S(\mathbf{r}) \quad (1)$$

where $\phi_P(\mathbf{r})$ and $\phi_S(\mathbf{r})$ are the normalized polymer segmental density and solvent density, respectively, at position \mathbf{r} . The dependence of $\epsilon(\mathbf{r})$ on $\phi_P(\mathbf{r})$ and $\phi_S(\mathbf{r})$ should be taken into account as one makes the saddle-point approximation to derive the self-consistent field equations; this was not properly done in our previous work.¹ The correct results change eqs 10 and 11 in ref 1 to be

$$\omega_P(\mathbf{r}) = \chi_{PS} N \phi_S(\mathbf{r}) + \sum_{P' \neq P} \chi_{PP'} N \phi_{P'}(\mathbf{r}) + \eta(\mathbf{r}) - \frac{1}{2} \frac{\partial \epsilon(\mathbf{r})}{\partial \phi_P(\mathbf{r})} |\nabla \psi(\mathbf{r})|^2 \quad (2)$$

$$\omega_S(\mathbf{r}) = \sum_P \chi_{PS} N \phi_P(\mathbf{r}) + \eta(\mathbf{r}) - \frac{1}{2} \frac{\partial \epsilon(\mathbf{r})}{\partial \phi_S(\mathbf{r})} |\nabla \psi(\mathbf{r})|^2 \quad (3)$$

while the rest of the SCF equations in ref 1 remain unchanged (note that the equations used in ref 41 of that paper need to be changed accordingly).

For the interface of a phase-separated polyelectrolyte solution studied in ref 1, the correct results are compared with those shown previously in Figures 1–3; no qualitative difference is seen for these cases. For the diblock polyelectrolytes and polyelectrolyte blends studied in ref 1, because a good solvent was used, $\epsilon(\mathbf{r})$ is almost uniform and the differences are negligible.

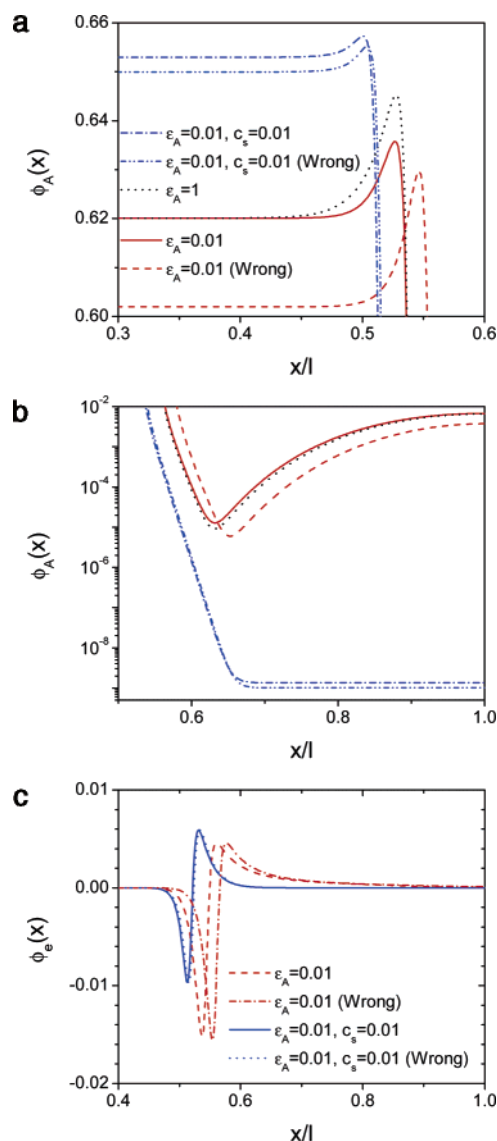


Figure 1. Comparison with the incorrect results shown in Figure 1 of ref 1 for the smeared charged distribution. (a) Polymer density profiles across the interface between the polymer-rich and polymer-poor phases; (b) Semilogarithmic plot of the polymer density profiles in the polymer-poor phase, where the legend is the same as in (a); (c) Total charge density profiles.

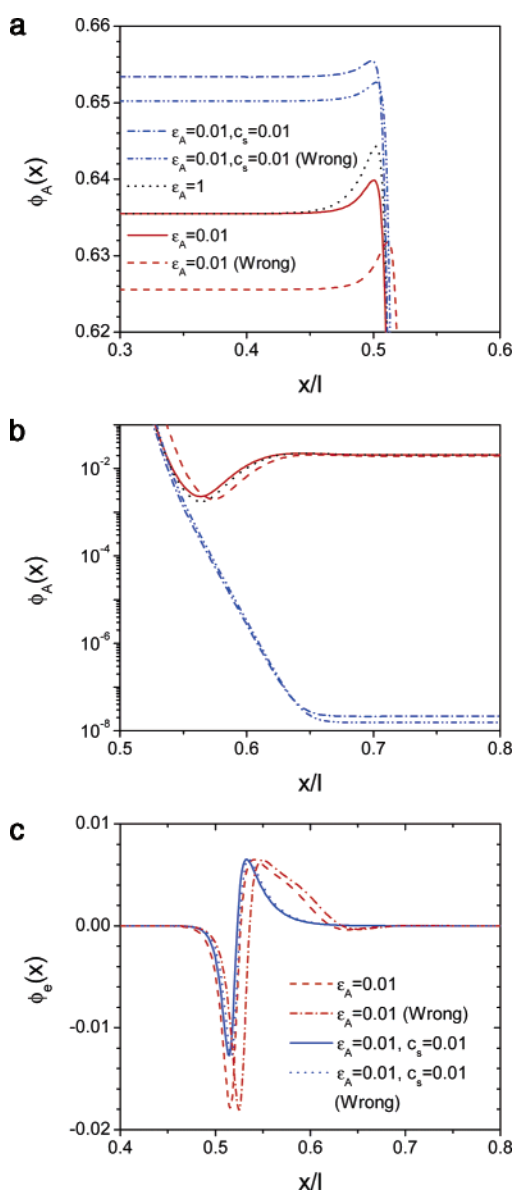


Figure 2. Comparison with the incorrect results shown in Figure 2 of ref 1 for the annealed charged distribution. (a) Polymer density profiles across the interface between the polymer-rich and polymer-poor phases; (b) Semilogarithmic plot of the polymer density profiles in the polymer-poor phase, where the legend is the same as in (a); (c) Total charge density profiles.

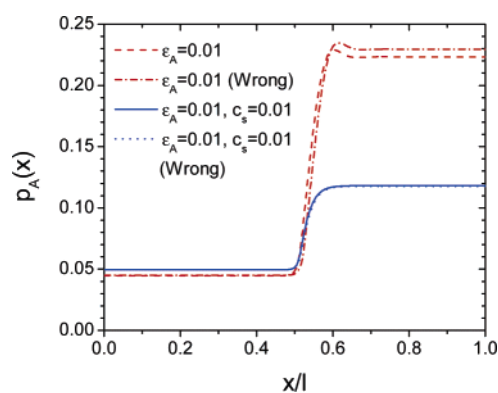


Figure 3. Comparison with the incorrect results shown in Figure 3 of ref 1 for the annealed charged distribution.

References and Notes

- (1) Wang, Q.; Taniguchi, T.; Fredrickson, G. H. *J. Phys. Chem. B* **2004**, *108* (21), 6733.

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