Role of cross-links in bundle formation, phase separation and gelation of long filaments

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Role of cross-links in bundle formation, phase separation and gelation of long filaments

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PACS. 82.70.Gg – Gels and sols.
PACS. 05.70.Fh – Phase transitions: general studies.
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A recently published paper (Zilman A. G. and Safran S. A., Europhys. Lett., 63 (2003) 139) contains several typographic errors.

The probability of junction break-up, at the end of the second paragraph on p. 141, should read

\[ \phi_j a_{f}^{-1} e^{-(\mu_j - \epsilon_j)/T} e^{-(f-2)(\epsilon_e - \mu_e)/T}. \]

A numerical prefactor is missing in eq. (5), which should read

\[ c_s(\phi, \rho, T) = \frac{4}{f(f-2)a_f} \phi^{(4-f)/2} e^{\epsilon_j/T} (1 - \phi) \left( \frac{\phi^{(1-f)/2} e^{\epsilon_e/T}}{1 + \phi^{1/2} e^{-\epsilon_e/T}} \right) \left( 1 + a_f e^{-\epsilon_j/T} \phi^{f/2} \right) . \]

The equation for the percolation threshold on p. 143 should be

\[ c_{\text{perc}} = (\rho/f(f-2)a_f) \phi^{(1-f)/2} e^{\epsilon_j/T} (1 + a_f e^{-\epsilon_j/T} \phi^{f/2}) / \left( 1 + e^{-\epsilon_e/T} \phi^{1/2} \right) . \]

The expression for \( F_b \) on p. 144 should read “In the limit of \( m \to \infty \), \( F_b = c(\ln c - 1) - \rho \ln(4\pi) + c \ln(1 + qe^{-\epsilon_j/T} \phi). \)”

The definition of \( A \) on p. 144 should read \( Ac = \frac{1}{2} \phi^2 + \rho(\ln(\rho/\phi^{1/2}) - 1) - \rho \ln 4\pi. \)

Figure 1 has minor graphic editing errors. The correct version is presented on the next page.

These typographic errors do not affect any of the results and the conclusions of the paper.
Fig. 1 – (a) The monomer concentration-temperature, \((\phi, e^{\epsilon_4/T}/a_f)\), plane of the phase diagram for strong, fourfold junctions for \(\epsilon_j, \epsilon_e < 0\) and \(\epsilon_4/\epsilon_e = 1\); \(c = 0.05, \rho = 0.005\). The thick line shows the spinodal of the junctions-ends transition. The dashed line is the percolation line to the right of which a connected network is formed. The bundles appear to the right of the dotted line; \(a_f/q = 1\). (b) Monomer/crosslink concentration, \((\phi, c)\), section of the phase diagram for \(a_f e^{\epsilon_4/T} = 0.015, |\epsilon_e/\epsilon_4| = 10/3, \rho = 0.005\). The upper line delineates the region of the phase separation. The lower, dashed, curve is the percolation line, above which a connected network is formed. Bundles are predicted to appear to the right of the dotted line.