

Erratum

“Chemical reactions and the principle of maximal rate of entropy production”

by Hans Ziegler, Z. angew. Math. Phys. 34, 832–844 (1983)

I am grateful to Mr. S. Canonica and Dr. U. Müller-Herold for pointing out that, although the standard equation (5.6) is incompatible with the special form (4.22) of the fundamental equation, it need not violate its general form (4.13),

$$\Phi_{\alpha}(\xi_{\alpha}, \xi_{\alpha}) = -RT \xi_{\alpha} \sum_i v_{\alpha i} \ln \left(\frac{n_i \bar{N}}{\bar{n}_i N} \right).$$

They also observe that the requirement that Φ_{α} be positive definite in ξ_{α} is not clear.

In fact, the last statement should be replaced by the condition that Φ be positive in any real process. Furthermore, the standard equation may be obtained from the general fundamental equation if the dissipation functions are defined by

$$\Phi_{\alpha} = -k_{\alpha}^{-1} RT \xi_{\alpha}^2 \left[\prod_i \left(\frac{n_i \bar{N}}{\bar{n}_i N} \right)^{v_{\alpha i}} - \prod_i \left(\frac{n_i \bar{N}}{\bar{n}_i N} \right)^{v_{\alpha i}^*} \right]^{-1} \sum_i v_{\alpha i} \ln \left(\frac{n_i \bar{N}}{\bar{n}_i N} \right),$$

where the n_i and N have still to be expressed in ξ . Since the sum and the expression between brackets have always opposite signs, Φ is positive in forward and in backward processes.

Thus, the standard equation is compatible with Thermodynamics. However, my conclusion that it does not disprove the principle of maximal rate of entropy production remains valid.