Supporting Information.

Given that the binding reaction is linked to protonation events the experimental values of ΔH_{obs} determined in any particular buffer will include contributions from the heat of ionization of the buffer as shown in eq. 1.

$$\Delta H_{obs} = \Delta H_{corr} + \Delta n_{H+}\Delta H_{ion} \quad (1)$$

where ΔH_{ion} is the buffer ionization enthalpy and Δn_{H+} is the number of protons released (positive value) or absorbed (negative value) by the buffer as a result of binding or release, respectively, of protons upon complex formation (1,2). Using eq 1 it is possible, in a model-independent manner, to estimate the value of the binding enthalpy corrected for buffer ionization (ΔH_{corr}) and Δn_{H+} at a particular pH by performing experiments in at least two buffers which differ in their ionization enthalpies. For the PriA interaction with the SSB-Ct peptides in 0.02M NaCl, values of $\Delta H_{obs,Tris}$= -6.9 kcal/mol and $\Delta H_{obs,Cacodylate}$= -17.6 kcal/mol were obtained in Tris and Cacodylate buffers, respectively (see Table 1 and 2). Since the corresponding ionization enthalpies for each buffer are known ($\Delta H_{ion,Tris}$= 11.34 kcal/mol, (3) and $\Delta H_{ion,\ Cacodylate}$= -0.47 kcal/mol (4)) we estimate Δn_{H+}= +0.91 and ΔH_{corr} = -17.2 kcal/mol (2).

References

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