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*Article*

## Isoperibolic Titration Calorimetry as a Tool for the Prediction of Thermodynamic Properties of Cyclodextrins

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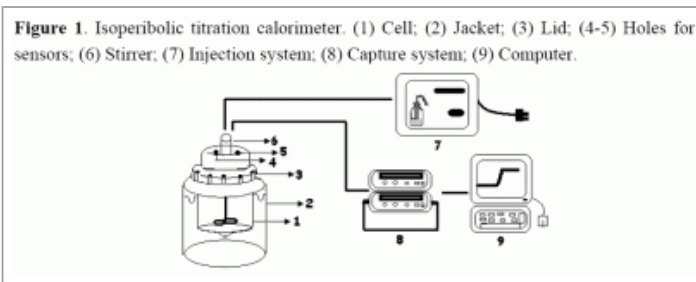
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**Abstract:** The interaction of guest molecules ranging from pentan-1-ol to octan-1-ol with  $\alpha$ -cyclodextrin ( $\alpha$ -CD) in water of has been studied calorimetrically at 283.15, 288.15, 293.15, 298.15 and 308.15 K with an isoperibolic titration calorimeter designed in our laboratory. The calorimetric method employed allows the determination of the thermodynamic parameters characterizing the binding process,  $\Delta G_m^\circ$ ,  $\Delta H_m^\circ$ ,  $\Delta S_m^\circ$  and  $\Delta Cp^\circ$ , namely free energy, enthalpy, and calorific capacity. These results show that in the temperature range investigated, the entropy change increased with chain length. This is in line with what is expected for a hydrophobic dehydration process. However, that effect is not expected to lead to the more pronounced negative  $CH_2$ -increment observed for  $n_c > 5$  or 6. As for many other ligand binding processes, we can observe a significant enthalpy - entropy compensation for this system, both with respect to temperature and structure.



**Keywords:** Isoperibolic titration calorimetry; Cyclodextrins; Thermodynamic properties

**To Cite this Article**

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● **AMA Style**

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