

ISOTHERMAL TITRATION CALORIMETRY SYSTEM (ITC)



Descriptions

Isothermal titration microcalorimeters measure the heat change that occurs when two molecules interact. Heat is released or absorbed as a result of the redistribution and formation of non-covalent bonds when the interacting molecules go from the free to the bound state. ITC monitors these heat changes by measuring the differential power, applied to the cell heaters, required to maintain zero temperature difference between the reference and sample cells as the binding partners are mixed.

The reference cell usually contains water, while the sample cell contains one of the binding partners (the sample, often but not necessarily a macromolecule) and a stirring syringe which holds the other binding partner (the ligand).

The ligand is injected into the sample cell, typically in 0.5 to 2 μL aliquots, until the ligand concentration is two- to three-fold greater than the sample. Each injection of ligand results in a heat pulse that is integrated with respect to time and normalized for concentration to generate a titration curve of kcal/mol vs molar ratio (ligand/sample). The resulting isotherm is fitted to a binding model to generate the affinity (KD), stoichiometry (n) and enthalpy of interaction (ΔH).

Further Information

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Brand-Model

MALVERN/ MicroCal PEAQ-ITC

Basic Specifications

Measurement types: Affinity (KD), Enthalpy ΔH , Entropy ΔS , Stoichiometry (n)

Sample volume: 280 μL

Cell volume: 200 μL

Injection syringe volume: 40 μL

Injection volume precision: < 1% @ 2 μL

Sample throughput: 0-12 per 8 h day

Cell material: Hastelloy

Cell: Coin-shaped

Temperature range: 2°C to 80°C

Temperature stability: $\pm 0.00012^\circ\text{C}$

Equipment Website (Manufacturer)

<https://www.malvernpanalytical.com/en/products/product-range/microcal-range/microcal-itc-range/microcal-peaq-itc>

Types of samples

Liquid

Location

Central Analytical Laboratory (T02, 01-25-01)

Operator

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