

Possible applications of isothermal calorimetry in pharma, food, and biomedical industries: the cases of quality control and drug resistance.

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Isothermal calorimetry is a very sensitive tool and it has been used to detect microbial growth under many conditions. Despite its sensitivity and its reliability and its simplicity, the use of isothermal microcalorimetry in the industry has remained rather limited to chemical applications such as cement curing or explosive stability. Here we investigate the use of isothermal microcalorimetry in quality control of drugs, drug development, and spread of antimicrobial resistance in food (dairy products). In addition to the applications, we emphasize the critical role of data analysis and automation to make isothermal microcalorimetry appealing for such industries. In particular, we focus on automation of growth curve analysis, growth detection, and tools for accurate and quantitative differentiations between thermograms. Using tools such as “support vector machines” and “dynamic time warping”. Finally we will show the limitation of these tools for cases such as biofilm formation of time to kill assays.