PEAQ-DSC Sample Submission Guideline for
Malvern Capillary Differential Scanning Calorimeter (Auto PEAQ-DSC)

I. Sample Submission

1. Apply an account on the BCF reservation system using your official email address, which will be used to identify your affiliations. BCF will not accept service requests from public e-mail domains, such as gmail, outlook or yahoo, etc.

2. File sample submission form on-line under instrument "Auto PEAQ-DSC".

3. After confirming the charges and experiment time through reservation system, samples and buffers may be submitted to Miss Jin-Hsuan Yu (Tel: 27855696 x4024, e-mail: bcf@gate.sinica.edu.tw). If BCF does not receive your samples before the scheduled time listed in the service request application form, the facility will add an extra charge for the delay, unless early notification is sent by emails more than two days in advance

4. BCF will not compensate for your sample loss or data loss under any circumstances (hardware or software failure, operator error, or others). All experimental results are for research only. Without written permission from Academia Sinica, the user shall not claim, announce, or mislead the public into interpreting that the results of this testing is in any way related to the commercial development of the user. In addition, the user shall not in any form (including but not restricted to commercial marketing, for example advertisements, either online or offline, product packaging, catalogs, investment information etc,) use the title, logo, name, trademark or symbols that are that of Academia Sinica or similar to that of the facility, that gives the false impression of a commercial collaboration.

5. Data analysis is the responsibility of users.

II. Sample preparation

1. Samples submitted to BCF are non-hazardous, non-toxic and nonpathogenic. No radioactive or microbial samples are allowed.

2. Dialysis and gel filtration is recommended for buffer exchange. Buffer is needed to fill the reference cell; therefore, it should have the same compositions as the buffer in which your sample is dissolved.

3. Avoid reducing agents such as dithiothreitol (DTT) and β-mercaptoethanol (BME). If reducing agent is needed, try less than 2mM tris(2-carboxyl)phosphine (TCEP). Tris buffer should be avoided if possible because its pKa varies with temperature.

4. Spin samples for 5 minutes at 12,000 g to remove any possible aggregates, preferably through centrifugal filters.

5. Sample volume for each measurement is 350 µl and sample concentration typically ranges from 0.2 mg/mL to 1mg/mL for proteins. Please provide 2mL buffer for each sample and additional 10mL buffer for setting up the first one.

III. Experimental setting:

1. The following experimental parameters will be used for most of the samples:
   Well Plate Volume (µl): 325
   Starting Temperature (°C): 10
   Final Temperature (°C): 90
   Scan rate (°C/Hr.): 240
   Feedback Mode/Gain: High
   PreScan Thermostat (min.): 15
   PostScan Thermostat (min.): 0

2. We will run 3 scans of blank experiments to warm up the instrument using the buffer of your first sample.
3. For every sample, there is a blank experiment for buffer subtraction.
4. There will be no additional warm-up scans running for additional samples.
5. At the end of the experiment, we will perform 2 buffer scans to check the condition of our capillary cells using the buffer of your first sample.
6. Samples will be processed according to the sequence that is filled in the application form.
7. Please note that we may run your samples ending at higher temperature (>110 to 130℃) only after the samples are tested at 110℃. Once this is confirmed, you may specify temperature range and scanning rate in the Notes when filling the sample submission form on-line.
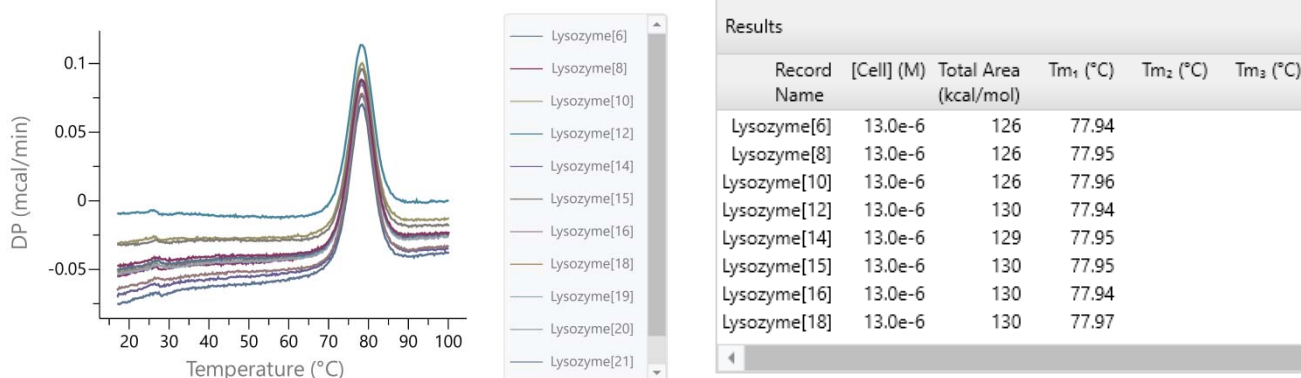
IV. Data Analysis

1. Raw data and buffer subtracted plots can be downloaded through BCF reservation system. Buffer subtracted plots are generated by subtracting the preceding buffer scan and "Spline" function is used for progressing baseline under a transition.
2. The table of Tm and Total Area Heat (KJ/Mol) is generated by clicking "Tm Report".
3. For model fitting your DSC data, for example, to get ΔC_p, ΔH_{VH}, please refer to Chapter 5 of the **MicroCal PEAQ-DSC Automated User Manual**.
4. Please note that data analysis is the responsibility of users. Users are welcome to consult BCF staff for the software if there is no training course in the near future.

V. Acknowledgement

Please acknowledge us if research supported and/or data generated by this instrument results in publications. For example,

Buffer Subtracted Plot

Record Name	[Cell] (M)	Total Area (kcal/mol)	Tm₁ (°C)	Tm₂ (°C)	Tm₃ (°C)
Lysozyme[6]	13.0e-6	126	77.94		
Lysozyme[8]	13.0e-6	126	77.95		
Lysozyme[10]	13.0e-6	126	77.96		
Lysozyme[12]	13.0e-6	130	77.94		
Lysozyme[14]	13.0e-6	129	77.95		
Lysozyme[15]	13.0e-6	130	77.95		
Lysozyme[16]	13.0e-6	130	77.94		
Lysozyme[18]	13.0e-6	130	77.97		

Fitted Data Plot

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