Identification of industrial detergent enzymes by SDS-PAGE and MALDI-TOF mass spectrometry

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Table S1. Composition of the detergent base used in this work (wt%).

Component	wt%
Surfactant	18.93
Builder	37.87
Filler	34.08
Anti-redeposition agent	2.96
Anti-foaming agent	0.36
Fluorescent whitening agent (FWA)	0.47
Water	5.33

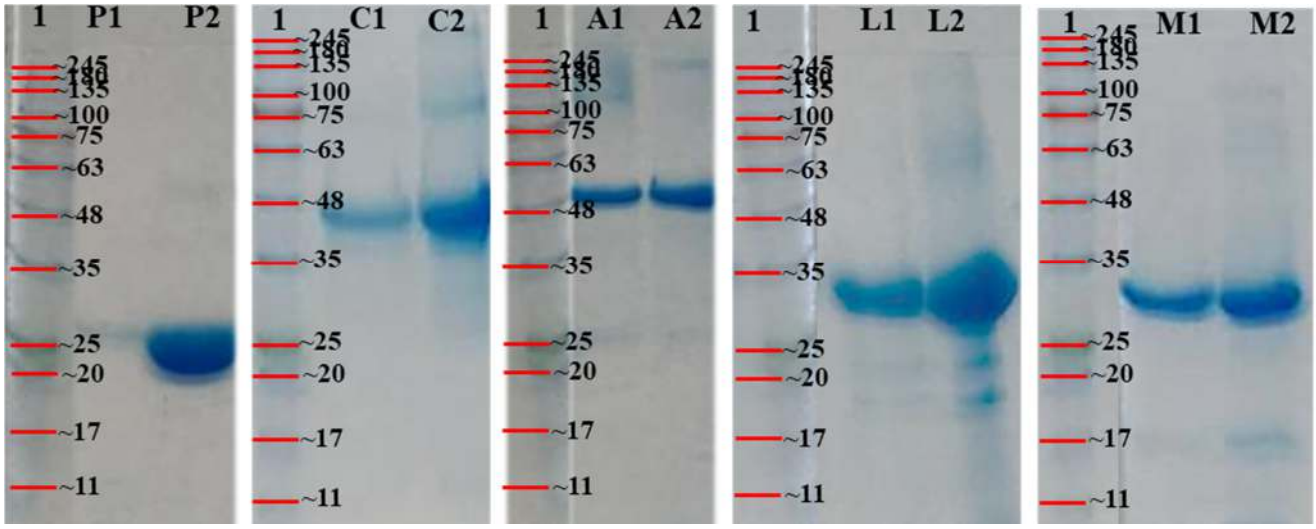

Figure S1 SDS-PAGE results for comparison of protein bands appearing without and with enzyme precipitation in standard enzymes; in all gels first lane: molecular weight marker, second lane: non-precipitated enzyme, and third lane: precipitated enzyme; P: Protease, C: Cellulase, A: α-Amylase, L: Lipase, M: Mannanase.

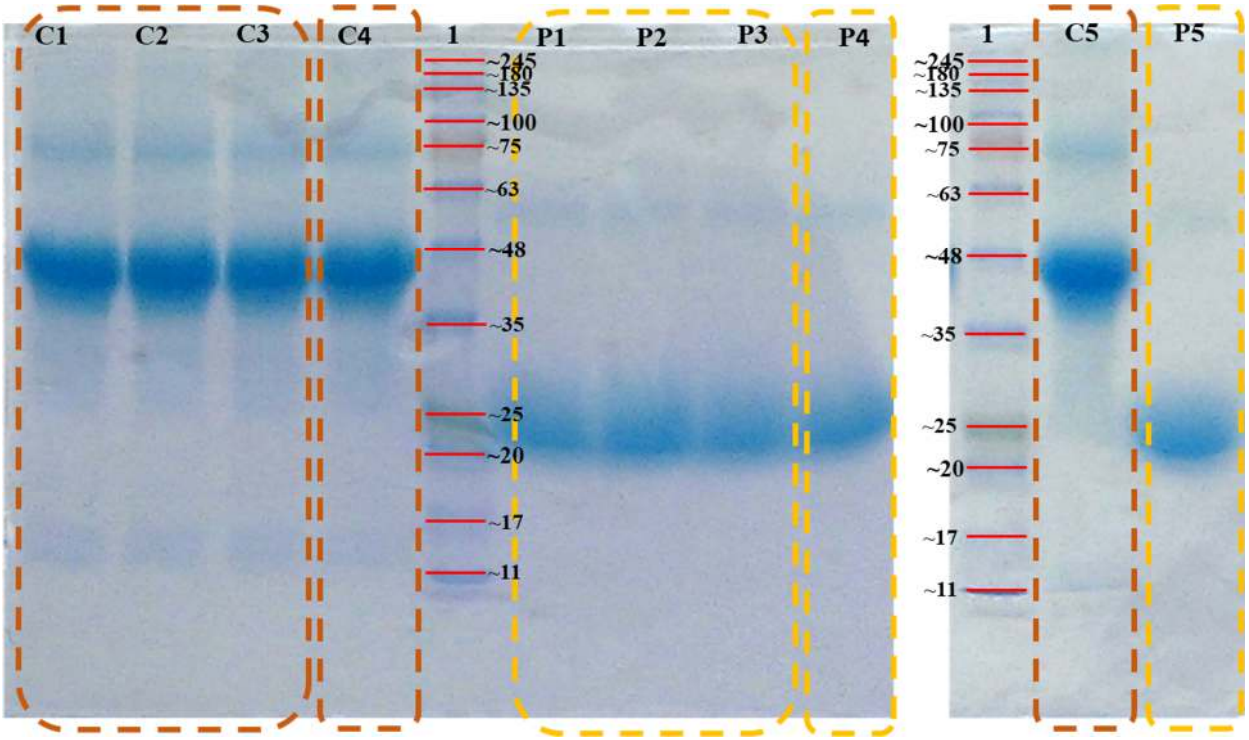

Figure S2 Repeatability of enzyme precipitation process; lane C1-C3: standard enzyme of Cellulase, lane P1-P3: standard enzyme of Protease. Repeatability of sample preparation process; lane C4: standard enzyme of Cellulase, lane P4: standard enzyme of Protease. Repeatability between gels; lane C5: standard enzyme of Cellulase, lane P5: standard enzyme of Protease, lane 1 in both of them: molecular weight marker.

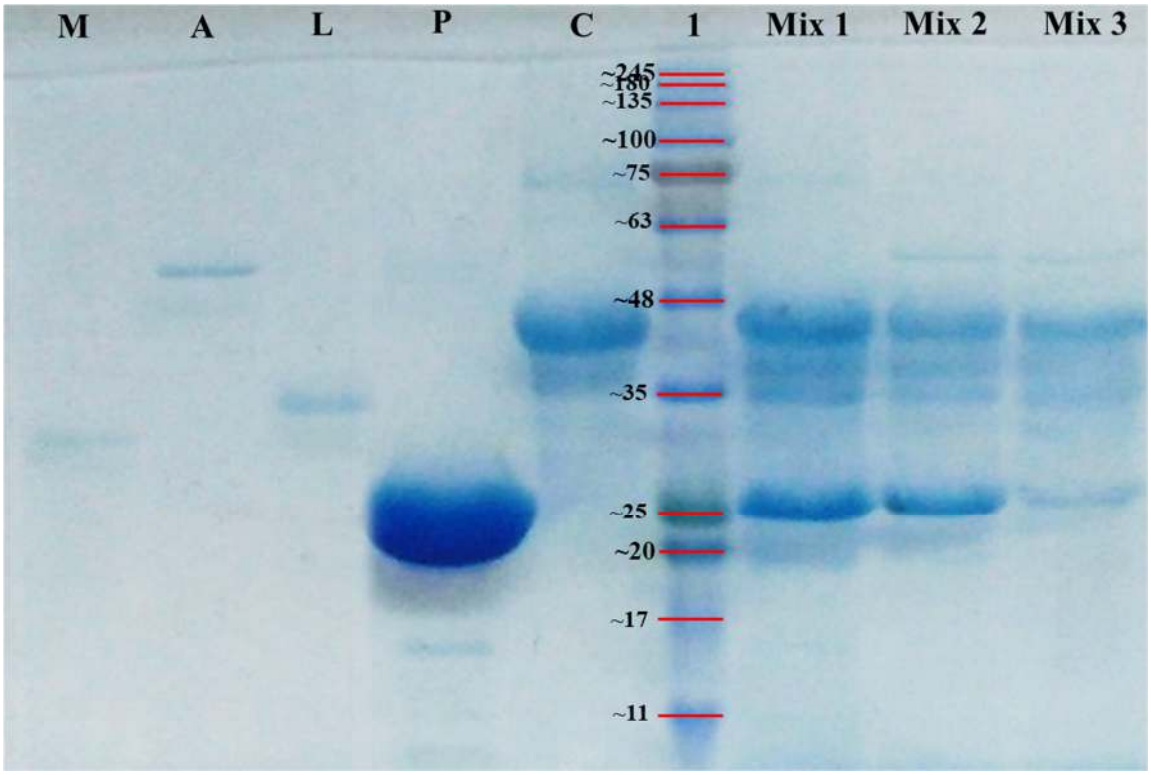

Figure S3 Efficiency evaluation of the proposed method by separating the manually mixed standard enzymes (coomassie brilliant blue staining), lane M: Mannanase, lane A: α-Amylase, lane L: Lipase, lane P: Everlase, lane C: Cellulase, lane 1: molecular weight marker, lane Mix 1: a mixture of Protease, Lipase, and Cellulase, lane Mix 2: a mixture of Protease, Lipase, α-Amylase, and Cellulase, and lane Mix 3: a mixture of Protease, Lipase, α-Amylase, Mannanase, and Cellulase.

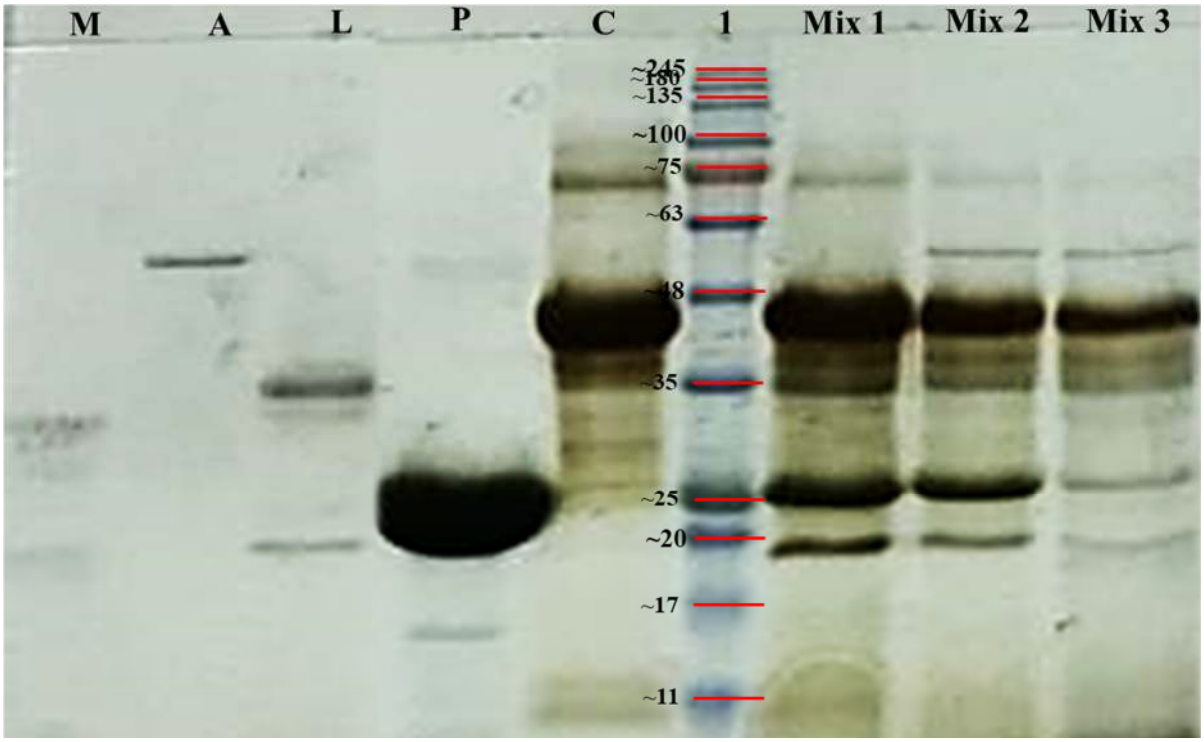

Figure S4 Efficiency evaluation of the proposed method by separating the manually mixed standard enzymes (silver nitrate staining), lane M: Mannanase, lane A: α-Amylase, lane L: Lipase, lane P: Everlase, lane C: Cellulase, lane 1: molecular weight marker, lane Mix 1: a mixture of Protease, Lipase, and Cellulase, lane Mix 2: a mixture of Protease, Lipase, α-Amylase, and Cellulase, and lane Mix 3: a mixture of Protease, Lipase, α-Amylase, Mannanase, and Cellulase.

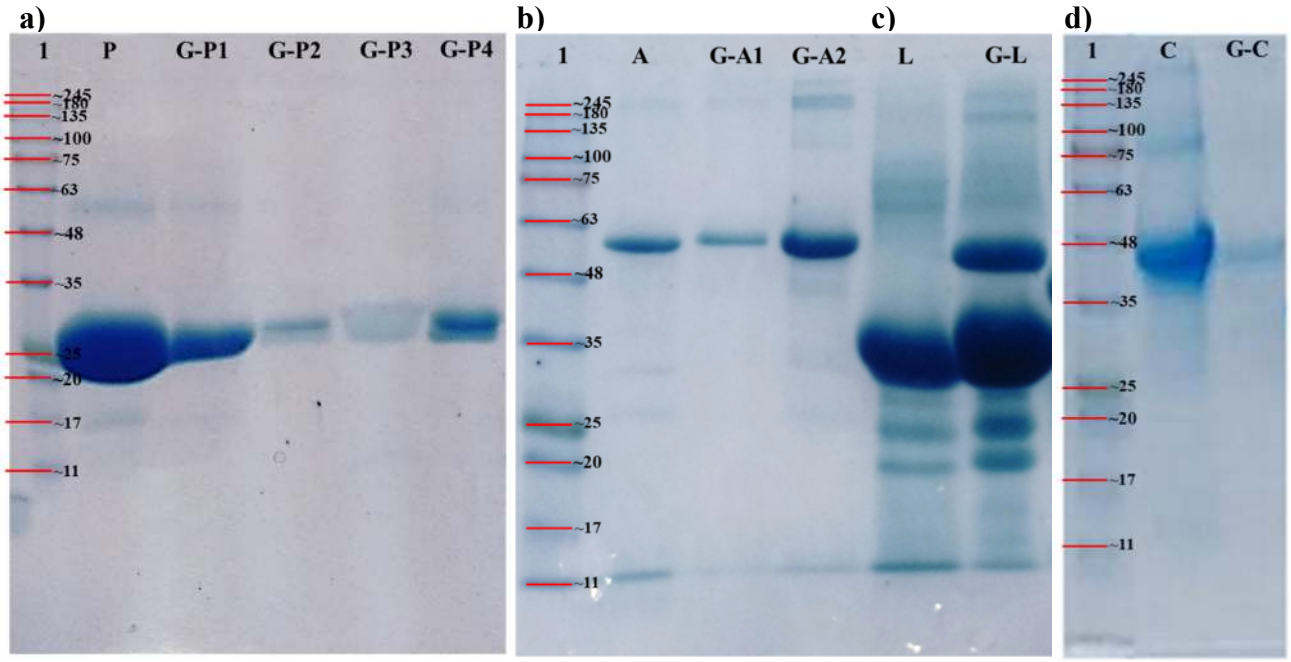

Figure S5 SDS-PAGE analysis of a) four different types of granular proteases, lane P: standard enzyme of Protease, lane G-P1: Granular Protease 1, lane G-P2: Granular Protease 2, lane G-P3: Granular Protease 3, lane G-P4: Granular Protease 4; b) tow different types of granular α-Amylases, lane A: standard enzyme of α-Amylase, lane G-A1: Granular α-Amylase 1, lane G-A2: Granular α-Amylase 2; c) granular lipase, lane L: standard enzyme of Lipase, lane G-L: Granular Lipase; and d) granular cellulase, lane C: standard enzyme of Cellulase, lane G-C: Granular Cellulase, lane 1 in all gels: molecular weight marker.

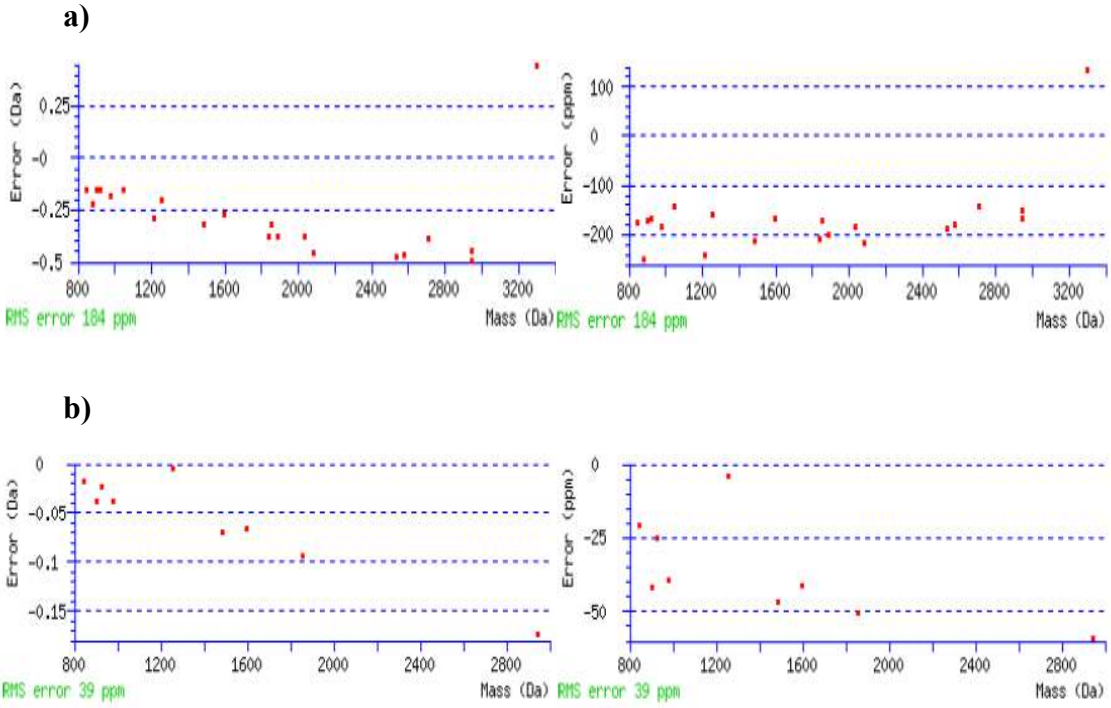

Figure S6 Residual plots in terms of Da. and ppm for standard enzymes of a) α-Amylase and b) granular enzyme of α-Amylase.

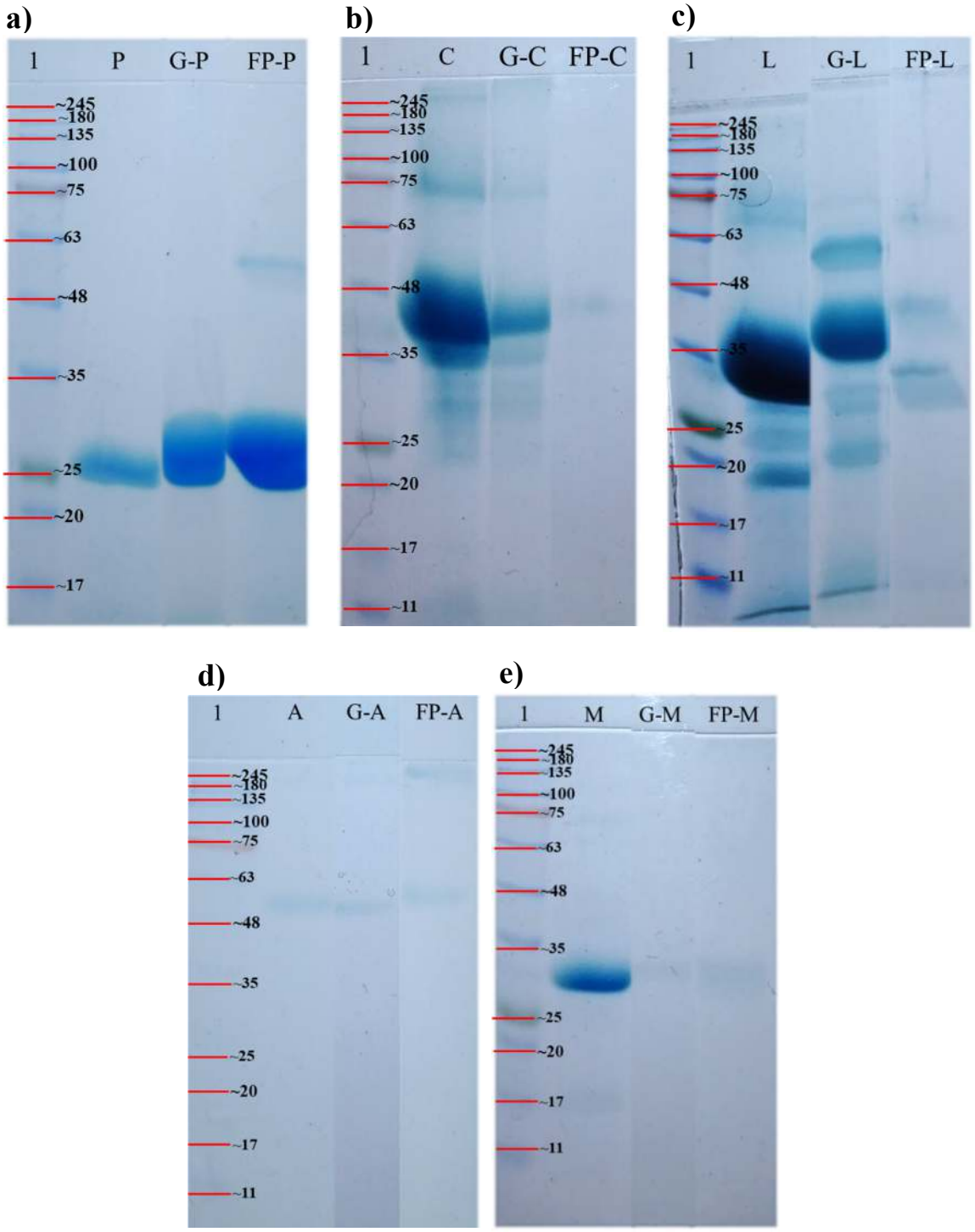

Figure S7 SDS-PAGE analysis of fortified powder detergent by a) Protease, b) Cellulase, c) Lipase, d) α-Amylase, and e) Mannanase; in all gels the first lane: molecular weight marker, second lane: standard enzyme, third lane: granular enzyme, and forth lane: fortified powder detergent base.

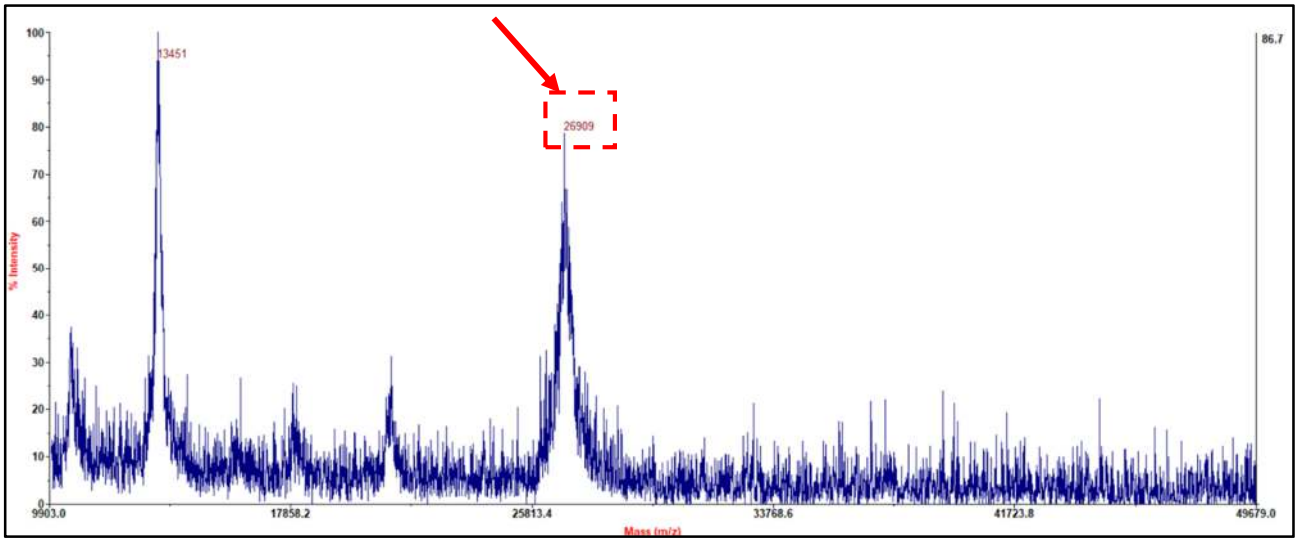

Figure S8 The MALDI-TOF mass spectrum of the commercial powder detergent containing a protease.