Correction to: Preparation and Characterization of Amino-Functionalized Zeolite/SiO₂ Materials for Trypsin–Chymotrypsin Co-immobilization

Demet Doğan^{1,2} · Selda Sezer¹ · Ahmet Ulu¹ · Süleyman Köytepe¹ · Burhan Ateş¹

Received: 30 April 2021 / Accepted: 17 May 2021 / Published online: 27 May 2021
© Springer Science+Business Media, LLC, part of Springer Nature 2021

Correction to: Catalysis Letters (2021)

<https://doi.org/10.1007/s10562-021-03636-2>

An error appeared in our paper entitled “Preparation and Characterization of Amino-Functionalized Zeolite/SiO₂ Materials for Trypsin–Chymotrypsin Co-immobilization” published in Catalysis Letters. Unfortunately, there was a reference error in Tables 1, 2 and References in the original

article. The correct Tables 1, 2 and References are given below. This correction does not affect the overall results and conclusions of the article.

The original article has been corrected.

The original article can be found online at <https://doi.org/10.1007/s10562-021-03636-2>.

✉ Ahmet Ulu
ahmet.ulu@inonu.edu.tr

✉ Burhan Ateş
burhan.ates@inonu.edu.tr

¹ Department of Chemistry, Faculty of Arts and Science, İnönü University, Malatya, Turkey

² Department of Biology, Faculty of Arts and Science, İnönü University, Malatya, Turkey

Table 1 Comparison of the proposed support with other zeolite species in terms of immobilization yield

Support	Enzyme	Yield (%)	Reference
Zeolite/SiO ₂	Trypsin–chymotrypsin	56.9 ± 5.2	This work
Amino-functionalized zeolite/SiO ₂	Trypsin–chymotrypsin	80.7 ± 7.6	This work
Nano-ZSM-5	Alkaline protease	79.77	[59]
Commercial 13X zeolite	Acid phosphatase	51	[60]
Nano Pore Zeolite	α-amylase	23.2	[61]
ITQ-2	Lipase	27	[62]
Zeolite X	Lipase	0	[62]

Nano-ZSM-5 crystalline mesoporous zeolite, de laminated zeolites; ITQ-2

Table 2 Comparison of kinetic parameters (Km, Vmax) for soluble and immobilized trypsin–chymotrypsin with other studies

Enzyme	Km	Vmax	References
Soluble	5.1 mM	23 mM/min	[58]
Immobilized	7.88 mM	18.3 mM/min	
Soluble	9.7 mM	5890 U/mg	[63]
Immobilized	13.6 mM	3946 U/mg	
Soluble	9.3 mM	7345 U/mg	[64]
Immobilized	16.8 mM	5115 U/mg	
Immobilized	21.7 mM	5387 U/mg	
Soluble	1.8 ± 0.0 mM	296.8 ± 6.1 μmol/mL/min	[57]
Immobilized	5.0 ± 0.1 mM	1.0 ± 0.0 μmol/mL/min	
Soluble	1.036 ± 0.035 mM	1.486 ± 0.105 U/mg	
Immobilized	1.863 ± 0.085 mM	0.893 ± 0.092 U/mg	[65]
Immobilized	1.351 ± 0.094 mM	1.157 ± 0.113 U/mg	
Soluble	0.51 ± 0.02 mM ^a	43.4 ± 0.8 μmol/min	This work
Immobilized	2.41 ± 0.10 mM ^b	40.5 ± 3.9 μmol/min	

Different letters indicate statistical significance at $p < 0.01$

References

57. Agyei D, Tambimuttu S, Kasargod B, Gao Y, He L (2014) J Biotechnol 188:53–60
58. Atacan K, Çakiroğlu B, Özacar M (2016) Food Chem 212:460–468
59. Kumari A, Kaur B, Srivastava R, Sangwan RS (2015) Biochem Biophys Rep 2:108–114
60. Alfani F, Cantarella L, Cantarella M, Gallifuoco A, Colella C (1994) Stud Surf Sci Catal 84:1115–1122
61. Talebi M, Vaezifar S, Jafary F, Fazilati M, Motamedi S (2016) Iran J Biotechnol 14:33–38
62. Macario A, Katovic A, Giordano G, Forni L, Carloni F, Filippini A, Setti L (2005) Stud Surf Sci Catal 381–394
63. Bayramoğlu G, Yilmaz M, Şenel AÜ, Arica MY (2008) Biochem Eng J 40:262–274
64. Bayramoglu G, Ozalp VC, Arica MY (2014) Ind Eng Chem Res 53:132–140
65. Zdarta J, Anteck K, Jędrzak A, Synoradzki K, Luczak M, Jesionowski T (2018) Colloids Surf B Biointerfaces 169:118–125

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.