

Click chemistry-based core-shell molecularly imprinted polymers for the determination of pyrimethamine in fish and plasma samples

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Table S1 Comparison of the proposed method with other established methods for the determination of pyrimethamine.

	Method	Sample preparation	Linear range	LOD	Ref.
Plasma	HPLC-MS	protein precipitation	0.02–5 µg/mL	nd	1
Plasma	HPLC-MS	protein precipitation	0.01–1.0 µg/mL	0.5 ng/mL	2
plasma	HPLC-MS/MS	liquid-liquid extraction	0.78–400 ng/mL	0.39 ng/mL	3
Plasma	HPLC-MS	liquid-liquid extraction	5–30 ng/mL	1.12 ng/mL	4
Milk	HPLC-MS/MS	solid-phase extraction	1.0–300 ng/mL	0.51 ng/mL	5
Milk	HPLC-MS	solid-phase extraction	nd	0.5 ng/mL	6
Formulations	HPLC	Filtration	0.2–4 µg/mL	60 µg/L	7
Pharmaceutical formulations	RP-HPLC	Dilution	0.5–3.0 mg/L	0.01 µg/mL	8
Pharmaceutical formulations	UV	complexation reaction	0–100 mg/L	5 µg/mL	9
equipment surfaces	HPLC	Dilution	0.129–4.02 µg/mL	0.042 µg/mL	10
feeds	HPLC	liquid-liquid extraction	2–5 µg/g	nd	11
Animal tissue/egg	HPLC	liquid-liquid extraction	0.01–1 µg/kg	10 ng/g	12
Whole blood	HPLC	solid-phase extraction	1–10 µg/mL	0.6 µg/mL	13
Serum and Urine	Acoustic wave	Molecularly imprinted polymers	14.9–24.87 mg/L	4.96 mg/L	14
Fish muscles	HPLC	liquid-liquid extraction	0–0.05 µg/g	0.005 mg/kg	15
Fish/plasma/urine	HPLC	Molecularly imprinted			This

1. J. K. Johannessen, I. Christiansen, D. R. Schmidt, E. Petersen, S.H. Hansen, Simultaneous determination of pyrimethamine, sulfadiazine and N-acetyl-sulfadiazine in plasma for monitoring infants in treatment of congenital toxoplasmosis, *Journal of Pharmaceutical and Biomedical Analysis*, 2005, 36, 1093-1098.
2. B. A. Sinnaeve, T. N. Decaestecker, P. G. Risha, J. P. Remon, C. Vervaet, J. F. V. Bocxlaer, Liquid chromatographic-mass spectrometric assay for simultaneous pyrimethamine and sulfadoxine determination in human plasma samples, *Journal of Chromatography A*, 2005, 1076, 97-102.
3. S. Sabarinath, R. P. Singh, R. C. Gupta, Simultaneous quantification of α-/β-diastereomers of arteether, sulphadoxine and pyrimethamine: A promising anti-relapse antimalarial therapeutic combination, by liquid chromatography tandem mass spectrometry, *Journal of Chromatography B*, 2006, 842, 36-42.
4. M. Sandhya, P. S. Shijkumar, A simplified liquid chromatography-mass spectrometry method for simultaneous determination of pyrimethamine, sulphadoxine and artesunate in human plasma, *Journal of Applied Pharmaceutical Science*, 2015, 5, 109-114.
5. U. Koesukwiwat, S. Jayanta, N. Leepipatpiboon, Validation of a liquid chromatography-mass spectrometry multi-residue method for the simultaneous determination of sulfonamides, tetracyclines, and pyrimethamine in milk, *Journal of Chromatography A*, 2007, 1140, 147-156.
6. U. Koesukwiwat, S. Jayanta, N. Leepipatpiboon, Solid-phase extraction for multiresidue determination of sulfonamides, tetracyclines, and pyrimethamine in Bovine's milk, *Journal of Chromatography A*, 2007, 1149, 102-111.
7. J. J. Berzas Nevado, G. Castaneda Penalvo, F. J. Guzman Bernardo, Simultaneous determination of sulfaquinoxaline, sulfamethazine and pyrimethamine by liquid chromatography, *Journal of Chromatography A*, 2000, 870, 169-177.
8. M. S. Arayne, N. Sultana, F. A. Siddiqui, S. Naseem, F. Qureshi, Simultaneous determination of pyrimethamine, sulfadoxine, mefloquine, and ibuprofen in pharmaceutical formulations by RP-HPLC, *Medicinal Chemistry Research*, 2010, 19, 1043-1054.
9. J. O. Onah, J. E. Odeiani, Simultaneous spectrophotometric determination of sulfadoxine and pyrimethamine in pharmaceutical formulations, *Journal of Pharmaceutical and Biomedical Analysis*, 2002, 30, 851-857.
10. M. B. Boca, Z. Apostolidis, E. Pretorius, A validated HPLC method for determining residues of a dual active ingredient anti-malarial drug on

manufacturing equipment surfaces, Journal of Pharmaceutical and Biomedical Analysis 2005, 37, 461–468.

11. P. S. Gong, S. L. Jeng, Y. F. Hsu, C. C. Lin, S. Y. Lin, Development of a method for the determination of pyrimethamine concentrations in feeds by ion-pairing

high-performance liquid chromatography, Journal of Food Protection, 2002, 65, 688–691.

12. S. Horii, M. Nishi, N. Oku, H. Miyakawa, M. Tezuka, Determination of pyrimethamine in animal tissue and egg by liquid chromatography with fluorescence detection, Journal of Aoac International 2001, 84, 1031-1034.

13. M. D. Green, D. L. Mount, H. Nettey, High-performance liquid chromatographic assay for the simultaneous determination of sulfadoxine and pyrimethamine from whole blood dried onto filter paper, Journal of Chromatography B, 2002, 767, 159–162.

14. H. Peng, C. Liang, D. He, L. Nie, S. Yao, Bulk acoustic wave sensor using molecularly imprinted polymers as recognition elements for the determination of pyrimethamine, Talanta, 2000, 52, 441–448.

15. G. P. Qian, J. Z. Yu, Determination of pyrimethamine in fish muscles using high performance liquid chromatography, Chinese Journal of Health Laboratory Technology 2005, 15, 697-698.