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REFERENCES

Ahmadi-Jouibari, T., Fattahi, N., Shamsipur, M., & Pirsaheb, M. (2013). Dispersive liquid–liquid microextraction followed by high-performance liquid chromatography–ultraviolet detection to determination of opium alkaloids in human plasma. *Journal of Pharmaceutical and Biomedical Analysis*, *85*, 14–20. https://doi.org/10.1016/j.jpba.2013.06.030

Alahyari, E., Setareh, M., Shekari, A., Roozbehani, G., & Soltaninejad, K. (2018). Analysis of opioids in postmortem urine samples by dispersive liquid-liquid microextraction and high performance liquid chromatography with photo diode array detection. *Egyptian Journal of Forensic Sciences*, *8*(1), 13. https://doi.org/10.1186/s41935-018-0046-x

Anonym. (2023). *1812-30-2(Bromazepam) Product Description*. Chemical Book. https://www.chemicalbook.com/ChemicalProductProperty_EN_CB3764505.htm

Antonio, A. D. S., Bhering, C. D. A., Wurzler, G. T., Carvalhosa, D. R., Jardim, A. C., Chalom, M. Y., Aquino Neto, F. R. D., & Vanini, G. (2024). Investigating the capability of UA-DLLME and DART-HRMS in the analysis of benzodiazepines in whole human blood. *Forensic Chemistry*, *39*, 100580. https://doi.org/10.1016/j.forc.2024.100580

AOAC Official Methods of Analysis. (2016). *Appendix F: Guidelines for Standard Method Performance Requirements*. AOAC International. 1-18.

B. Magnusson and U. Örnemark (eds). (2014). *Eurachem Guide: The Fitness for Purpose of Analytical Methods – A Laboratory Guide to Method Validation and Related Topics* (2nd ed). Eurachem.

Barceloux, D. G. (2012). Ketamine. In *Medical Toxicology of Drug Abuse* (pp. 110–119). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118105955.ch7

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Barone, R., Giorgetti, A., Cardella, R., Rossi, F., Garagnani, M., Pascali, J. P., Mohamed, S., Fais, P., & Pelletti, G. (2023). Development and validation of a fast UPLC-MS/MS screening method for the detection of 68 psychoactive drugs and metabolites in whole blood and application to post-mortem cases. *Journal of Pharmaceutical and Biomedical Analysis*, *228*, 115315. https://doi.org/10.1016/j.jpba.2023.115315

Chaytor, A. (2008). Alprazolam. In S.J. Enna & David B. Bylund (Eds.), *xPharm: The Comprehensive Pharmacology Reference* (pp. 1–4). Elsevier Inc.

Choi, J. Y., Heo, S., Yoo, G. J., Park, S.-K., Yoon, C.-Y., & Baek, S. Y. (2015). Development and validation of an LC-MS/MS method for the simultaneous analysis of 28 specific narcotic adulterants used in dietary supplements. *Food Additives & Contaminants: Part A*, *32*(7), 1029–1039. https://doi.org/10.1080/19440049.2015.1040080

Council of Europe. (2019). *European pharmacopoeia* (Tenth edition). Council of Europe : European Directorate for the Quality of Medicines and Healthcare.

Derringer, G., & Suich, R. (1980). Simultaneous Optimization of Several Response Variables. *Journal of Quality Technology*, *12*(4), 214–219. https://doi.org/10.1080/00224065.1980.11980968

Farsimadan, S., Goudarzi, N., Chamjangali, M. A., & Bagherian, G. (2016). Optimization of ultrasound-assisted dispersive liquid-liquid microextraction based on solidification of floating organic droplets by experimental design methodologies for determination of three anti-anxiety drugs in human serum and urine samples by high performance liquid chromatography. *Microchemical Journal*, *128*, 47–54. https://doi.org/10.1016/j.microc.2016.04.003

Feriduni, B., Farajzadeh, M. A., & Jouyban, A. (2019). Determination of Two Antiepileptic Drugs in Urine by Homogenous Liquid-Liquid Extraction Performed in A Narrow Tube Combined With Dispersive Liquid-liquid Microextraction Followed by Gas Chromatography-flame Ionization

UNIVERSITAS
GADJAH MADA
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Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Detection. *Iranian Journal of Pharmaceutical Research*, *Online First*. https://doi.org/10.22037/ijpr.2019.1100635

Fernández, P., González, C., Pena, M. T., Carro, A. M., & Lorenzo, R. A. (2013). A rapid ultrasound-assisted dispersive liquid–liquid microextraction followed by ultra-performance liquid chromatography for the simultaneous determination of seven benzodiazepines in human plasma samples. *Analytica Chimica Acta*, *767*, 88–96. https://doi.org/10.1016/j.aca.2013.01.016

Fernández, P., Regenjo, M., Ares, A., Fernández, A. M., Lorenzo, R. A., & Carro, A. M. (2019). Simultaneous determination of 20 drugs of abuse in oral fluid using ultrasound-assisted dispersive liquid–liquid microextraction. *Analytical and Bioanalytical Chemistry*, *411*(1), 193–203. https://doi.org/10.1007/s00216-018-1428-5

Fernández, P., Regenjo, M., Bermejo, A. M., Fernández, A. M., Lorenzo, R. A., & Carro, A. M. (2015). Analysis of drugs of abuse in human plasma by dispersive liquid-liquid microextraction and high-performance liquid chromatography: Analysis of drugs of abuse in human plasma by DLLME/HPLC. *Journal of Applied Toxicology*, *35*(4), 418–425. https://doi.org/10.1002/jat.3035

Fernández, P., Regenjo, M., Fernández, A. M., Lorenzo, R. A., & Carro, A. M. (2014). Optimization of ultrasound-assisted dispersive liquid–liquid microextraction for ultra performance liquid chromatography determination of benzodiazepines in urine and hospital wastewater. *Anal. Methods*, *6*(20), 8239–8246. https://doi.org/10.1039/C4AY01348D

Ferreira, S. L. C., Bruns, R. E., Ferreira, H. S., Matos, G. D., David, J. M., Brandão, G. C., da Silva, E. G. P., Portugal, L. A., dos Reis, P. S., Souza, A. S., & dos Santos, W. N. L. (2007). Box-Behnken design: An alternative for the optimization of analytical methods. *Analytica Chimica Acta*, *597*(2), 179–186. https://doi.org/10.1016/j.aca.2007.07.011

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Fields, A., & Wiegand, T. J. (2014). Opium and the Constituent Opiates. In *Encyclopedia of Toxicology* (pp. 698–701). Elsevier. https://doi.org/10.1016/B978-0-12-386454-3.00716-8

Fisichella, M., Odoardi, S., & Strano-Rossi, S. (2015). High-throughput dispersive liquid/liquid microextraction (DLLME) method for the rapid determination of drugs of abuse, benzodiazepines and other psychotropic medications in blood samples by liquid chromatography–tandem mass spectrometry (LC-MS/MS) and application to forensic cases. *Microchemical Journal*, *123*, 33–41. https://doi.org/10.1016/j.microc.2015.05.009

Ghobadi, M., Yamini, Y., & Ebrahimpour, B. (2014). SPE coupled with dispersive liquid-liquid microextraction followed by GC with flame ionization detection for the determination of ultra-trace amounts of benzodiazepines: Sample Preparation. *Journal of Separation Science*, *37*(3), 287–294. https://doi.org/10.1002/jssc.201300893

Goudarzi, N., Farsimadan, S., & Chamjangali, M. A. (2015). Optimization of modified dispersive liquid-liquid microextraction coupled with high-performance liquid chromatography for the simultaneous preconcentration and determination of nitrazepam and midazolam drugs: An experimental design. *Journal of Seperation Science*, *38*(10), 1673–1679. https://doi.org/doi:10.1002/jssc.201500007

Gupta, P. K. (2016). Neurotoxic agents. In *Fundamentals of Toxicology* (pp. 221–244). Elsevier. https://doi.org/10.1016/B978-0-12-805426-0.00020-2

Hara, K., Waters, B., Ikematsu, N., Tokuyasu, T., Fujii, H., Takayama, M., Matsusue, A., Kashiwagi, M., & Kubo, S. (2016). Development of a preparation method to produce a single sample that can be applied to both LC–MS/MS and GC–MS for the screening of postmortem specimens. *Legal Medicine*, *21*, 85–92. https://doi.org/10.1016/j.legalmed.2016.06.005

Harmita, A.A.K, Harahap, Y., & Supandi. (2019). *Liquid Chromatography – Tandem Mass Spectrometry (LC-MS/MS)*. PT ISFI Penerbitan.

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Hartel, R. W. (2012). Hard Candy: From Hard Crack to the Glass Transition. *The Manufacturing Confectioner*, *92*(9), 70–80.

Hartel, R. W., von Elbe, J. H., & Hofberger, R. (2018). Hard Candy. In R. W. Hartel, J. H. von Elbe, & R. Hofberger, *Confectionery Science and Technology* (pp. 211–244). Springer International Publishing. https://doi.org/10.1007/978-3-319-61742-8_8

Huvelle, S., Godet, M., Hecq, J.-D., Gillet, P., Bihin, B., Jamart, J., & Galanti, L. (2016). Long-term stability of ketamine hydrochloride 50mg/ml injection in 3ml syringes. *Annales Pharmaceutiques Françaises*, *74*(4), 283–287. https://doi.org/10.1016/j.pharma.2016.03.003

Indonesian Food and Drug Authority. (2018a). *Regulation No. 7 of 2018 on Prohibited Raw Materials in Processed Food*. State News Republic of Indonesia No. 731 of 2018.

Indonesian Food and Drug Authority. (2018b, April 4). *Clarification of Indonesian FDA about Case of Candy Suspected of Containing Drugs in Pekanbaru*. https://www.pom.go.id/new/view/more/klarifikasi/86/PENJELASAN-BPOM-RI--TENTANG-KASUS-PERMEN-YANG-DIDUGA-MENGANDUNG-NARKOBA--DI-PEKANBARU---.html.

Indonesian Government. (1997). *Law No. 05 of 1997 on Psychotropic*. State Gazette Republic of Indonesia No. 10 of 1997. State Secretariat. Jakarta.

Indonesian Government. (2009). *Law No. 35 of 2009 on Narcotics*. State Gazette Republic of Indonesia No. 143 of 2009. State Secretariat. Jakarta.

Indonesian Government. (2013). *Government Regulation No. 40 of 2013 oncerning on Implementation of Law No. 35 of 2009 on Narcotics*. State Gazette Republic of Indonesia No 96 of 2013.

Indonesian Government. (2017). *Presidential Regulation No. 80 of 2017 on Food and Drug Authority*. State Gazette Republic of Indonesia No. 180 of 2017.

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Islam, Md. A., Alam, Md. R., & Hannan, Md. O. (2012). Multiresponse optimization based on statistical response surface methodology and desirability function for the production of particleboard. *Composites Part B: Engineering*, *43*(3), 861–868. https://doi.org/10.1016/j.compositesb.2011.11.033

ISO. ISO/IEC 17025:2005. (2005). *General Requirements for the Competence of Testing and Calibration Laboratories*. *Volume 2005*, 1–34.

Jain, R., & Singh, R. (2016). Applications of dispersive liquid–liquid micro-extraction in forensic toxicology. *TrAC Trends in Analytical Chemistry*, *75*, 227–237. https://doi.org/10.1016/j.trac.2015.07.007

Jiang, R., & Ouyang, G. (2015). Fast Analytical Techniques Based on Microextraction. In *Comprehensive Analytical Chemistry* (Vol. 67, pp. 85–134). Elsevier. https://doi.org/10.1016/B978-0-444-63299-9.00003-X

Joewana, S., Margiyani, L., Padmohoedojo, L.G., Widayat, E., Ajisuksmo, C.R.P., & Tambunan, M. (2001). *Narkoba: Petunjuk Praktis Bagi Keluarga untuk Mencegah Penyalahgunaan Narkoba*. Media Pressindo. https://books.google.co.id/books?id=Lg4_SpmuuVcC&printsec=frontcover&hl=id#v=onepage&q&f=false. Accessed 2023, April 5

Kannouma, R. E., Hammad, M. A., Kamal, A. H., & Mansour, F. R. (2022). Miniaturization of Liquid-Liquid extraction; the barriers and the enablers. *Microchemical Journal*, *182*, 107863. https://doi.org/10.1016/j.microc.2022.107863

Kataoka, H. (2010). Recent developments and applications of microextraction techniques in drug analysis. *Analytical and Bioanalytical Chemistry*, *396*(1), 339–364. https://doi.org/10.1007/s00216-009-3076-2

Kohler, I., Schappler, J., Sierro, T., & Rudaz, S. (2013). Dispersive liquid–liquid microextraction combined with capillary electrophoresis and time-of-flight

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

mass spectrometry for urine analysis. *Journal of Pharmaceutical and Biomedical Analysis*, *73*, 82–89. https://doi.org/10.1016/j.jpba.2012.03.036

Kokosa, J. M. (2020). Dispersive Liquid-Liquid Microextraction. In *Liquid-Phase Extraction* (pp. 473–497). Elsevier. https://doi.org/10.1016/B978-0-12-816911-7.00016-5

Kwak, J.-S. (2005). Application of Taguchi and response surface methodologies for geometric error in surface grinding process. *International Journal of Machine Tools and Manufacture*, *45*(3), 327–334. https://doi.org/10.1016/j.ijmachtools.2004.08.007

Lin, Z., Li, J., Zhang, X., Qiu, M., Huang, Z., & Rao, Y. (2017). Ultrasound-assisted dispersive liquid-liquid microextraction for the determination of seven recreational drugs in human whole blood using gas chromatography–mass spectrometry. *Journal of Chromatography B*, *1046*, 177–184. https://doi.org/10.1016/j.jchromb.2017.01.024

Mandal, S. C., Mandal, V., & Das, A. K. (2015). Innovative Extraction Process Design and Optimization Using Design of Experimental Approach. In *Essentials of Botanical Extraction* (pp. 137–163). Elsevier. https://doi.org/10.1016/B978-0-12-802325-9.00007-0

Manousi, N., Raber, G., & Papadoyannis, I. (2017). Recent Advances in Microextraction Techniques of Antipsychotics in Biological Fluids Prior to Liquid Chromatography Analysis. *Separations*, *4*(2), 18. https://doi.org/10.3390/separations4020018

Manousi, N., & Samanidou, V. (2021). Green sample preparation of alternative biosamples in forensic toxicology. *Sustainable Chemistry and Pharmacy*, *20*, 100388. https://doi.org/10.1016/j.scp.2021.100388

Meng, L., Wang, B., Luo, F., Shen, G., Wang, Z., & Guo, M. (2011). Application of dispersive liquid–liquid microextraction and CE with UV detection for the chiral separation and determination of the multiple illicit drugs on

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

forensic samples. *Forensic Science International*, *209*(1–3), 42–47. https://doi.org/10.1016/j.forsciint.2010.12.003

Meng, L., Zhu, B., Zheng, K., & Fu, S. (2017). Ultrasound-assisted low-density solvent dispersive liquid–liquid microextraction for the determination of 4 designer benzodiazepines in urine samples by gas chromatography–triple quadrupole mass spectrometry. *Journal of Chromatography B, 1053*, 9–15. https://doi.org/10.1016/j.jchromb.2017.04.008

Ministry of Health of the Republic of Indonesia. (2019). *National Report of Basic Health Research 2018* (p. 628). The National Institute of Health Research and Development Publisher, Ministry of Health, Republic of Indonesia. http://repository.bkpk.kemkes.go.id/3514/1/Laporan%20Riskesdas%202018%20Nasional.pdf

Ministry of Health of the Republic of Indonesia. (2022a). *Ministerial Regulation No 10 of 2022 on Determination and Change of Psychotropic Classification*. State News Republic of Indonesia No 422. Jakarta.

Ministry of Health of the Republic of Indonesia. (2022b). *Ministerial Regulation No. 36 of 2022 on Change in Narcotics Classification*. State News Republic of Indonesia No. 1200. Jakarta.

Montesano, C., & Sergi, M. (2016). Microextraction techniques in illicit drug testing: Present and future. *Bioanalysis*, *8*(9), 863–866. https://doi.org/10.4155/bio-2016-0008

Montgomery, D. C. (2013). *Design and analysis of experiments* (Eighth edition). John Wiley & Sons, Inc.

Mourão, M. P. B., Kolk, A. H. J., & Janssen, H.-G. (2020). General principles and history. In *Hyphenations of Capillary Chromatography with Mass Spectrometry* (pp. 3–74). Elsevier. https://doi.org/10.1016/B978-0-12-809638-3.00001-6

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

National Narcotics Board. (2012). *Guidebook for Early Prevention of Drug Abuse*. Directorate of Dissemination, Information. Deputy of PreventionPencegahan, National Narcotics Board Republic of Indonesia.

National Narcotics Board. (2017). *Community Anti-Drug Education Module*. Directorate of Dissemination, Information. Deputy of PreventionPencegahan, National Narcotics Board Republic of Indonesia.

National Narcotics Board. (2020a). *Drug issues in Indonesia, 2019: A field note*. Research, Data, and Information Center, National Narcotics Board, Republic of Indonesia.

National Narcotics Board. (2020b, July 30). *BNN Chief Proud of Synergy with Customs and Excise in the Field for Significant Results*. https://bnn.go.id/kepala-bnn-bangga-sinergi-bea-cukai-lapangan-membuahkan/. Accessed 2023, March 02

National Narcotics Board. (2022). *NATIONAL-SURVEY-ON-DRUG-ABUSE-2021.pdf*. Research, Data, and Information Center National Narcotics Board of the Republic of Indonesia.

NicDaéid, N., & McKenzie, C. (2018). Introduction to Drugs of Abuse ☆. In *Reference Module in Chemistry, Molecular Sciences and Chemical Engineering* (p. B9780124095472144592). Elsevier. https://doi.org/10.1016/B978-0-12-409547-2.14459-2

Nielsen, S. S. (Ed.). (2017). *Food Analysis*. Springer International Publishing. https://doi.org/10.1007/978-3-319-45776-5

Nobay, F., & Acquisto, N. M. (2014). Barbiturates. In *Encyclopedia of Toxicology* (pp. 363–367). Elsevier. https://doi.org/10.1016/B978-0-12-386454-3.00696-5

Orfanidis, A., Gika, H. G., Theodoridis, G., Mastrogianni, O., & Raikos, N. (2021). A UHPLC–MS-MS Method for the Determination of 84 Drugs of Abuse

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

and Pharmaceuticals in Blood. *Journal of Analytical Toxicology*, *45*(1), 28–43. https://doi.org/10.1093/jat/bkaa032

Partodiharjo, S. (2008). *Kenali Narkoba dan Musuhi Penyalahgunaannya*. Erlangga. https://books.google.co.id/books?id=0FPiV5tYejcC&pg=PA7&hl=id&source=gbs_toc_r&cad=4#v=onepage&q&f=false. Accessed 2023, April 5

Pettersson Bergstrand, M., Helander, A., & Beck, O. (2016). Development and application of a multi-component LC–MS/MS method for determination of designer benzodiazepines in urine. *Journal of Chromatography B, 1035*, 104–110. https://doi.org/10.1016/j.jchromb.2016.08.047

Piergiovanni, M., Cappiello, A., Famiglini, G., Termopoli, V., & Palma, P. (2018). Determination of benzodiazepines in beverages using green extraction methods and capillary HPLC-UV detection. *Journal of Pharmaceutical and Biomedical Analysis*, *154*, 492–500. https://doi.org/10.1016/j.jpba.2018.03.030

Pourroy, B., Curti, C., Lamy, E., N'Gbesso, J., Krasse, I., & Vanelle, P. (2020). Availability of Morphine Oral Solution for Childhood Cancer Patients in Low-Income Countries: Compounding and Stability Study in a Cote d'Ivoire University Teaching Hospital. *Journal of Pain and Symptom Management*, *59*(1), e10–e13. https://doi.org/10.1016/j.jpainsymman.2019.10.005

Rezaee, M., Assadi, Y., Milani Hosseini, M.-R., Aghaee, E., Ahmadi, F., & Berijani, S. (2006). Determination of organic compounds in water using dispersive liquid–liquid microextraction. *Journal of Chromatography A*, *1116*(1–2), 1–9. https://doi.org/10.1016/j.chroma.2006.03.007

Risqi, D.M. & Yudianto, O. (2022). Urgensi Pengaturan Ketamin dalam Undang-Undang Nomor 35 Tahun 2009 tentang Narkotika. *Mimbar Keadilan*, *15, Nomor 1*, 11–26.

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Rivera-Vera, C., Lasarte-Aragonés, G., Bravo, M. A., Muñoz-Lira, D., Salazar, R., & Toledo-Neira, C. (2019). Ionic liquids-based dispersive liquid-liquid microextraction for determination of carcinogenic polycyclic aromatic hydrocarbons in tea beverages: Evaluation of infusion preparation on pollutants release. *Food Control*, *106*, 106685. https://doi.org/10.1016/j.foodcont.2019.06.011

Rosenberger, W., Teske, J., Klintschar, M., & Dziadosz, M. (2022). Detection of pharmaceuticals in "dirty sprite" using gas chromatography and mass spectrometry. *Drug Testing and Analysis*, *14*(3), 539–544. https://doi.org/10.1002/dta.3116

Roveri, F. L., Paranhos, B. A. P. B., & Yonamine, M. (2016). Determination of phenobarbital in hair matrix by liquid phase microextraction (LPME) and gas chromatography–mass spectrometry (GC–MS). *Forensic Science International*, *265*, 75–80. https://doi.org/10.1016/j.forsciint.2015.12.033

Saldanha, G., Pacheco, A., Pego, A., & Bairros, A. (2022). ANALYSIS OF BENZODIAZEPINES IN PLASMA SAMPLES BY DLLME AND LC-DAD: CRITICAL ASPECTS, FLAWS AND ISSUES ENCOUNTERED – A DISCUSSION. *Química Nova*. https://doi.org/10.21577/0100-4042.20170913

Sampaio, G. R., Lima, G. S., De Souza, S. B., & Soares, D. D. M. (2024). Use of psychoactive substances among university students from 2019 to 2020: A systematic review. *Brain, Behavior, & Immunity - Health*, *35*, 100724. https://doi.org/10.1016/j.bbih.2024.100724

Scientific Working Group for the Analysis of Seized Drugs. (2000). *Monograph Opium*. https://www.swgdrug.org/Monographs/OPIUM.pdf

Skartland, L. K., Mjøs, S. A., & Grung, B. (2011). Experimental designs for modeling retention patterns and separation efficiency in analysis of fatty acid methyl esters by gas chromatography–mass spectrometry. *Journal of*

UNIVERSITAS
GADJAH MADA
Ultrasound Assisted-Dispersive Liquid-Liquid Microextraction for Eight Psychoactive Substances in Hard Candy: Method Development and Validation
Mirahayu, Dr. Widiastuti Setyaningsi STP., M.Sc.
Universitas Gadjah Mada, 2024 | Diunduh dari http://etd.repository.ugm.ac.id/

Chromatography A, *1218*(38), 6823–6831. https://doi.org/10.1016/j.chroma.2011.07.077

The International Council for Harmonisation. (2005). *Validation of Analytical Procedures: Text and Methodology Q2(R1)*. *Volume 2005*.

The Steering Committee Indonesian Pharmacopoeia 6th Edition. (2020). *Indonesian Pharmachopoeia 6th Edition*. Directorate General of Pharmaceutical and Medical Devices. Ministry of Health. Republic of Indonesia.

Thompson, M., Ellison, S. L. R., & Wood, R. (2002). *Harmonized Guidelines for Single-Laboratory Validation of Methods of Analysis: (IUPAC Technical Report): Vol. Vol. 74, No. 5* (pp. 835–855) [Dataset]. Symposium on Harmonization of Quality Assurance Systems for Analytical Laboratories, Budapest, Hungary. Pure Appl. Chem. https://doi.org/10.1515/iupac.74.0084

Tian, H., Zhou, X., Chen, C., He, Y., Yu, H., & Zheng, X. (2017). *Simultaneous Determination of Pheno- barbital, Pentobarbital, Amobarbital and Secobarbital in Raw Milk via Liquid Chromatography with Electron Spray Ionization Tandem Mass Spectrometry*. *37*(6).

Tsai, W.-C., & Huang, S.-D. (2009). Dispersive liquid–liquid microextraction with little solvent consumption combined with gas chromatography–mass spectrometry for the pretreatment of organochlorine pesticides in aqueous samples. *Journal of Chromatography A*, *1216*(27), 5171–5175. https://doi.org/10.1016/j.chroma.2009.04.086

United Nation Office on Drug and Crime. (2021). *Synthetic Drugs in East and Southeast Asia Latest developments and challenges 2021*. Global SMART Programme. https://www.unodc.org/unodc/en/scientists/2021-regional-synthetic-drugs-in-east-and-southeast-asia.html. Accessed 2023, March 2

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United Nation Office on Drug and Crime. (2022). *Globar Smart Update: Vol. Volume 27*. Global SMART Programme Laboratory and Scientific Service. www.unodc.org/documents/scientific/Global_SMART_Update_2022_Vol.27.pdf. Accessed 2023, March 10

United Nations. (2016). *Terminology and information on drugs* (Third edition). United Nations.

Usui, K., Hayashizaki, Y., Hashiyada, M., & Funayama, M. (2012). Rapid drug extraction from human whole blood using a modified QuEChERS extraction method. *Legal Medicine*, *14*(6), 286–296. https://doi.org/10.1016/j.legalmed.2012.04.008

Vera Candioti, L., De Zan, M. M., Cámara, M. S., & Goicoechea, H. C. (2014). Experimental design and multiple response optimization. Using the desirability function in analytical methods development. *Talanta*, *124*, 123–138. https://doi.org/10.1016/j.talanta.2014.01.034

Vermeire, A. (1999). Stability and compatibility of morphine. *International Journal of Pharmaceutics*, *187*(1), 17–51. https://doi.org/10.1016/S0378-5173(99)00181-7

Wachełko, O., Szpot, P., Tusiewicz, K., Nowak, K., Chłopaś-Konowałek, A., & Zawadzki, M. (2023). An ultra-sensitive UHPLC-QqQ-MS/MS method for determination of 54 benzodiazepines (pharmaceutical drugs, NPS and metabolites) and z-drugs in biological samples. *Talanta*, *251*, 123816. https://doi.org/10.1016/j.talanta.2022.123816

World Health Organisation. (1994). *WHO Lexicon of Alcohol and Drug Terms*. World Health Organization.

Xie, Z. (2023). Dispersive liquid-liquid microextraction coupled with gas chromatography-mass spectrometry (GC-MS) for the determination of soy sauce aroma compounds. *Food Control*.

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GADJAH MADA
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Xu, F., Li, Q., Wei, W., Liu, L., & Li, H. (2018). Development of a Liquid–Liquid Microextraction Method Based on a Switchable Hydrophilicity Solvent for the Simultaneous Determination of 11 Drugs in Urine by GC–MS. *Chromatographia*, *81*(12), 1695–1703. https://doi.org/10.1007/s10337-018-3643-9

Xu, F., & Liu, L. (2019). Simultaneous determination of free methamphetamine, pethidine, ketamine and tramadol in urine by dispersive liquid–liquid microextraction combined with GC–MS. *Forensic Sciences Research*, *4*(2), 188–194. https://doi.org/10.1080/20961790.2017.1377386

Zhang, X., Lin, Z., Li, J., Huang, Z., Rao, Y., Liang, H., Yan, J., & Zheng, F. (2017). Rapid determination of nine barbiturates in human whole blood by liquid chromatography-tandem mass spectrometry. *Drug Testing and Analysis*, *9*(4), 588–595. https://doi.org/10.1002/dta.2002