
BIBLIOGRAPHY

CHAPTER I

- 1 Friedman, S. H. *Functional Synthetic Receptors* Edited by Thomas Schrader (Philipps-Universität Marburg) and Andrew D. Hamilton (Yale University). Wiley-VCH Verlag GbH & Co. KGaA: Weinheim. 2005. xii + 428 pp. \$180.00. ISBN 3-527-30655-2. *Journal of the American Chemical Society* **127**, 16747-16748, doi:10.1021/ja0597808 (2005).
- 2 Knill, C. J. & Kennedy, J. F. *Principles and Methods in Supramolecular Chemistry*: H.-J. Schneider and A.K. Yatsimirsky; John Wiley and Sons, Ltd, Chichester, 2000, xii+349 pages, ISBN 0-471-97253-3, £39-95. *Carbohydrate Polymers* **47**, 211, doi:https://doi.org/10.1016/S0144-8617(01)00282-X (2002).
- 3 Philip, D. *Supramolecular chemistry: Concepts and perspectives*. By J.-M. Lehn, VCH, Weinheim 1995, x, 271 pp., softcover, DM 58.00, ISBN 3-527-2931 1-6. *Advanced Materials* **8**, 866-868, doi:10.1002/adma.19960081029 (1996).
- 4 Rotello, V. M. *Core Concepts in Supramolecular Chemistry and Nanochemistry* By Jonathan W. Steed (Durham University, U.K.), David R. Turner (Monash University, Australia), and Karl J. Wallace (University of Southern Mississippi). John Wiley & Sons, Ltd: Chichester. 2007. xii + 308 pp. \$50. ISBN 978-0-470-85867-7. *Journal of the American Chemical Society* **129**, 14524-14524, doi:10.1021/ja0769853 (2007).
- 5 Persch, E., Dumele, O. & Diederich, F. Molecular recognition in chemical and biological systems. *Angew Chem Int Ed Engl* **54**, 3290-3327 (2015).
- 6 Schneider, H. J. Binding mechanisms in supramolecular complexes. *Angew Chem Int Ed Engl* **48**, 3924-3977 (2009).
- 7 Schmidtchen, F. P. Hosting anions. The energetic perspective. *Chemical Society Reviews* **39**, 3916-3935, doi:10.1039/c0cs00038h (2010).

- 8 Hunter, C. A. Quantifying intermolecular interactions: guidelines for the molecular recognition toolbox. *Angew Chem Int Ed Engl* **43**, 5310-5324 (2004).
- 9 Yu, G., Jie, K. & Huang, F. Supramolecular Amphiphiles Based on Host–Guest Molecular Recognition Motifs. *Chemical Reviews* **115**, 7240-7303, doi:10.1021/cr5005315 (2015).
- 10 Iglesias, E. Inclusion Complexation of Novocaine by β -Cyclodextrin in Aqueous Solutions. *The Journal of Organic Chemistry* **71**, 4383-4392, doi:10.1021/jo052666n (2006).
- 11 Liu, J., Hennink, W. E., van Steenbergen, M. J., Zhuo, R. & Jiang, X. Versatile Supramolecular Gene Vector Based on Host–Guest Interaction. *Bioconjugate Chemistry* **27**, 1143-1152, doi:10.1021/acs.bioconjchem.6b00094 (2016).
- 12 Aytac, Z. *et al.* Fast-Dissolving, Prolonged Release, and Antibacterial Cyclodextrin/Limonene-Inclusion Complex Nanofibrous Webs via Polymer-Free Electrospinning. *J Agric Food Chem* **64**, 7325-7334 (2016).
- 13 Chen, X. *et al.* Light-Induced Hydrogel Based on Tumor-Targeting Mesoporous Silica Nanoparticles as a Theranostic Platform for Sustained Cancer Treatment. *ACS Appl Mater Interfaces* **8**, 15857-15863 (2016).
- 14 Lin, N. & Dufresne, A. Supramolecular hydrogels from in situ host-guest inclusion between chemically modified cellulose nanocrystals and cyclodextrin. *Biomacromolecules* **14**, 871-880 (2013).
- 15 Kida, T., Iwamoto, T., Asahara, H., Hinoue, T. & Akashi, M. Chiral Recognition and Kinetic Resolution of Aromatic Amines via Supramolecular Chiral Nanocapsules in Nonpolar Solvents. *Journal of the American Chemical Society* **135**, 3371-3374, doi:10.1021/ja312367k (2013).
- 16 Shi, Z. Q., Cai, Y. T., Deng, J., Zhao, W. F. & Zhao, C. S. Host-Guest Self-Assembly Toward Reversible Thermoresponsive Switching for Bacteria Killing and Detachment. *ACS Appl Mater Interfaces* **8**, 23523-23532 (2016).

- 17 Zhu, W., Zhang, K., Chen, Y. & Xi, F. Simple, Clean Preparation Method for Cross-Linked α -Cyclodextrin Nanoparticles via Inclusion Complexation. *Langmuir* **29**, 5939-5943, doi:10.1021/la400478d (2013).
- 18 Li, H. *et al.* Visible light-driven water oxidation promoted by host-guest interaction between photosensitizer and catalyst with a high quantum efficiency. *J Am Chem Soc* **137**, 4332-4335 (2015).
- 19 Rodríguez-López, M. I. *et al.* Thorough characterization and stability of HP- β -cyclodextrin thymol inclusion complexes prepared by microwave technology: A required approach to a successful application in food industry. *Journal of the Science of Food and Agriculture* **99**, 1322-1333, doi:10.1002/jsfa.9307 (2019).
- 20 Kfoury, M., Geagea, C., Ruellan, S., Greige-Gerges, H. & Fourmentin, S. Effect of cyclodextrin and cosolvent on the solubility and antioxidant activity of caffeic acid. *Food Chem* **278**, 163-169, doi:https://doi.org/10.1016/j.foodchem.2018.11.055 (2019).
- 21 Mourtzinis, I. *et al.* Natural food colorants derived from onion wastes: Application in a yoghurt product. *ELECTROPHORESIS* **39**, 1975-1983, doi:10.1002/elps.201800073 (2018).
- 22 Bakirhan, N. K., Tok, T. T. & Ozkan, S. A. The redox mechanism investigation of non-small cell lung cancer drug: Erlotinib via theoretical and experimental techniques and its host-guest detection by β -Cyclodextrin nanoparticles modified glassy carbon electrode. *Sensors and Actuators B: Chemical* **278**, 172-180, doi:https://doi.org/10.1016/j.snb.2018.09.090 (2019).
- 23 Strokopytov, B. *et al.* X-ray Structure of Cyclodextrin Glycosyltransferase Complexed with Acarbose. Implications for the Catalytic Mechanism of Glycosidases. *Biochemistry* **34**, 2234-2240, doi:10.1021/bi00007a018 (1995).
- 24 Bellringer, M. E., Smith, T. G., Read, R., Gopinath, C. & Olivier, P. β -Cyclodextrin: 52-Week toxicity studies in the rat and dog. *Food and Chemical Toxicology* **33**, 367-376, doi:https://doi.org/10.1016/0278-6915(94)00149-I (1995).

- 25 Sayed, M., Gubbala, G. K. & Pal, H. Contrasting interactions of DNA-intercalating dye acridine orange with hydroxypropyl derivatives of β -cyclodextrin and γ -cyclodextrin hosts. *New Journal of Chemistry* **43**, 724-736, doi:10.1039/c8nj04067b (2019).
- 26 Ho, S., Thoo, Y. Y., Young, D. J. & Siow, L. F. Stability and recovery of cyclodextrin encapsulated catechin in various food matrices. *Food Chem* **275**, 594-599, doi:https://doi.org/10.1016/j.foodchem.2018.09.117 (2019).
- 27 de Oliveira, G. G. G. *et al.* Compatibility study of paracetamol, chlorpheniramine maleate and phenylephrine hydrochloride in physical mixtures. *Saudi Pharmaceutical Journal* **25**, 99-103, doi:https://doi.org/10.1016/j.jsps.2016.05.001 (2017).
- 28 Shah, H. N., Halquist, M. T. & Gerk, P. M. Direct detection of phenylephrine 3-O-sulfate in LS180 human intestinal cells using a novel hydrophilic interaction liquid chromatography (HILIC) assay. *Journal of Chromatography B* **1040**, 67-72, doi:https://doi.org/10.1016/j.jchromb.2016.11.018 (2017).
- 29 Kuan, Y.-C., Xu, Y.-B., Wang, W.-C. & Yang, M.-T. Enantioselective synthesis of (R)-phenylephrine by *Serratia marcescens* BCRC10948 cells that homologously express SM_SDR. *Enzyme and Microbial Technology* **110**, 14-19, doi:https://doi.org/10.1016/j.enzmictec.2017.12.001 (2018).
- 30 Kernan, W. N. *et al.* Phenylpropanolamine and the Risk of Hemorrhagic Stroke. *New England Journal of Medicine* **343**, 1826-1832, doi:10.1056/nejm200012213432501 (2000).
- 31 Tette, P. A. S., Guidi, L. R., Bastos, E. M. A. F., Fernandes, C. & Gloria, M. B. A. Synephrine - A potential biomarker for orange honey authenticity. *Food Chem* **229**, 527-533, doi:10.1016/j.foodchem.2017.02.108 (2017).
- 32 Arai, K., Jin, D., Kusu, F. & Takamura, K. Determination of p-hydroxymandelic acid enantiomers in urine by high-performance liquid chromatography with electrochemical detection. *Journal of Pharmaceutical and Biomedical Analysis* **15**, 1509-1514, doi:https://doi.org/10.1016/S0731-7085(97)00038-1 (1997).

- 33 Wheaton, T. A. & Stewart, I. Feruloylputrescine : Isolation and Identification from Citrus Leaves and Fruit. *Nature* **206**, 620, doi:10.1038/206620a0 (1965).
- 34 Vieira, S. M., Theodoro, K. H. & Glória, M. B. A. Profile and levels of bioactive amines in orange juice and orange soft drink. *Food Chem* **100**, 895-903, doi:https://doi.org/10.1016/j.foodchem.2005.10.050 (2007).
- 35 Gregory, P. J. Evaluation of the Stimulant Content of Dietary Supplements Marketed as “Ephedra-Free”. *Journal of Herbal Pharmacotherapy* **7**, 65-72, doi:10.1080/J157v07n01_06 (2007).
- 36 Hallas, J., Bjerrum, L., Støvring, H. & Andersen, M. Use of a Prescribed Ephedrine/Caffeine Combination and the Risk of Serious Cardiovascular Events: A Registry-based Case-Crossover Study. *American Journal of Epidemiology* **168**, 966-973, doi:10.1093/aje/kwn191 (2008).
- 37 Dragull, K., Breksa Ap 3rd Fau - Cain, B. & Cain, B. Synephrine content of juice from Satsuma mandarins (Citrus unshiu Marcovitch).
- 38 Artiss, J. D., Brogan K Fau - Brucal, M., Brucal M Fau - Moghaddam, M., Moghaddam M Fau - Jen, K. L. C. & Jen, K. L. The effects of a new soluble dietary fiber on weight gain and selected blood parameters in rats.
- 39 Comerford, K. B., Artiss, J. D., Jen, K. L. & Karakas, S. E. The beneficial effects of alpha-cyclodextrin on blood lipids and weight loss in healthy humans. *Obesity* **19**, 1200-1204 (2011).
- 40 Gan, R.-Y. *et al.* in *Sprouted Grains* (eds Hao Feng, Boris Nemzer, & Jonathan W. DeVries) 191-246 (AACC International Press, 2019).
- 41 Yu, Y. *et al.* Saccharomyces-derived carbon dots for biosensing pH and vitamin B 12. *Talanta* **195**, 117-126, doi:https://doi.org/10.1016/j.talanta.2018.11.010 (2019).
- 42 Li, S. *et al.* Encapsulation of Vitamin B1 and Its Phosphate Derivatives by Cucurbit[7]uril: Tunability of the Binding Site and Affinity by the Presence of

- Phosphate Groups. *The Journal of Organic Chemistry* **81**, 1300-1303, doi:10.1021/acs.joc.5b02666 (2016).
- 43 Abo Dena, A. S. & Ammar, A. A. H-point standard addition for simultaneous reagent-free spectrophotometric determination of B1 and B6 vitamins. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* **206**, 491-497, doi:https://doi.org/10.1016/j.saa.2018.08.047 (2019).
- 44 Aloysius, A., Ramanathan, R., Christy, A., Baskaran, S. & Antony, N. Experimental and theoretical studies on the corrosion inhibition of vitamins – Thiamine hydrochloride or biotin in corrosion of mild steel in aqueous chloride environment. *Egyptian Journal of Petroleum* **27**, 371-381, doi:https://doi.org/10.1016/j.ejpe.2017.06.003 (2018).
- 45 Abdou, E. & Hazell, A. S. Thiamine Deficiency: An Update of Pathophysiologic Mechanisms and Future Therapeutic Considerations. *Neurochemical Research* **40**, 353-361, doi:10.1007/s11064-014-1430-z (2015).
- 46 Voelker, A. L., Miller, J., Running, C. A., Taylor, L. S. & Mauer, L. J. Chemical stability and reaction kinetics of two thiamine salts (thiamine mononitrate and thiamine chloride hydrochloride) in solution. *Food Research International* **112**, 443-456, doi:https://doi.org/10.1016/j.foodres.2018.06.056 (2018).
- 47 Melymuk, L. *et al.* Challenges in the Analysis of Novel Flame Retardants in Indoor Dust: Results of the INTERFLAB 2 Interlaboratory Evaluation. *Environmental Science & Technology* **52**, 9295-9303, doi:10.1021/acs.est.8b02715 (2018).
- 48 Mitro, S. D. *et al.* Consumer Product Chemicals in Indoor Dust: A Quantitative Meta-analysis of U.S. Studies. *Environmental Science & Technology* **50**, 10661-10672, doi:10.1021/acs.est.6b02023 (2016).
- 49 Ruan, Y. *et al.* Stereoisomer-Specific Trophodynamics of the Chiral Brominated Flame Retardants HBCD and TBEC in a Marine Food Web, with Implications for Human Exposure. *Environmental Science & Technology* **52**, 8183-8193, doi:10.1021/acs.est.8b02206 (2018).

- 50 Arnot, J. A. *et al.* Toward a consistent evaluative framework for POP risk characterization. *Environ Sci Technol* **45**, 97-103 (2011).
- 51 Nguyen, T. N. T., Lee, H.-Y. & Choi, S.-D. in *Persistent Organic Chemicals in the Environment: Status and Trends in the Pacific Basin Countries I Contamination Status* Vol. 1243 *ACS Symposium Series* Ch. 9, 193-218 (American Chemical Society, 2016).
- 52 Zegers, B. N. *et al.* Levels of Hexabromocyclododecane in Harbor Porpoises and Common Dolphins from Western European Seas, with Evidence for Stereoisomer-Specific Biotransformation by Cytochrome P450. *Environmental Science & Technology* **39**, 2095-2100, doi:10.1021/es049209t (2005).
- 53 Peng, X., Wei, D., Huang, Q. & Jia, X. Debromination of Hexabromocyclododecane by Anaerobic Consortium and Characterization of Functional Bacteria. *Frontiers in Microbiology* **9**, doi:10.3389/fmicb.2018.01515 (2018).
- 54 Yan, X. *et al.* Disposal of hexabromocyclododecane (HBCD) by grinding assisted with sodium persulfate. *RSC Advances* **7**, 23313-23318, doi:10.1039/c7ra02689g (2017).
- 55 Annahazi, A., Roka, R., Rosztoczy, A. & Wittmann, T. Role of antispasmodics in the treatment of irritable bowel syndrome. *World J Gastroenterol* **20**, 6031-6043 (2014).
- 56 Martinez-Vazquez, M. A. *et al.* Effect of antispasmodic agents, alone or in combination, in the treatment of Irritable Bowel Syndrome: systematic review and meta-analysis. *Rev Gastroenterol Mex* **77**, 82-90 (2012).
- 57 Catterall, W. A. & Zheng, N. Deciphering voltage-gated Na⁺ and Ca²⁺ channels by studying prokaryotic ancestors. *Trends in Biochemical Sciences* **40**, 526-534, doi:10.1016/j.tibs.2015.07.002 (2015).
- 58 Wu, J. *et al.* Structure of the voltage-gated calcium channel Cav1.1 at 3.6 Å resolution. *Nature* **537**, 191, doi:10.1038/nature19321
<https://www.nature.com/articles/nature19321#supplementary-information> (2016).

- 59 Flarakos, J., Morand, K. L. & Vouros, P. High-Throughput Solution-Based Medicinal Library Screening against Human Serum Albumin. *Analytical Chemistry* **77**, 1345-1353, doi:10.1021/ac048685z (2005).
- 60 Zsila, F. Subdomain IB Is the Third Major Drug Binding Region of Human Serum Albumin: Toward the Three-Sites Model. *Molecular Pharmaceutics* **10**, 1668-1682, doi:10.1021/mp400027q (2013).
- 61 Dalvit, C., Fagerness, P. E., Hadden, D. T., Sarver, R. W. & Stockman, B. J. Fluorine-NMR experiments for high-throughput screening: theoretical aspects, practical considerations, and range of applicability. *J Am Chem Soc* **125**, 7696-7703 (2003).

CHAPTER II

- 1 Szejtli, J. Introduction and General Overview of Cyclodextrin Chemistry. *Chemical Reviews* **98**, 1743-1754, doi:10.1021/cr970022c (1998).
- 2 Cramer, F., Saenger, W. & Spatz, H. C. Inclusion Compounds. XIX.1a The Formation of Inclusion Compounds of α -Cyclodextrin in Aqueous Solutions. Thermodynamics and Kinetics. *Journal of the American Chemical Society* **89**, 14-20, doi:10.1021/ja00977a003 (1967).
- 3 Piñeiro, Á. *et al.* On the Characterization of Host-Guest Complexes: Surface Tension, Calorimetry, and Molecular Dynamics of Cyclodextrins with a Non-ionic Surfactant. *The Journal of Physical Chemistry B* **111**, 4383-4392, doi:10.1021/jp0688815 (2007).
- 4 Giuffrida, S., Ventimiglia, G., Petralia, S., Conoci, S. & Sortino, S. Facile Light-Triggered One-Step Synthesis of Small and Stable Platinum Nanoparticles in an Aqueous Medium from a β -Cyclodextrin Host-Guest Inclusion Complex. *Inorganic Chemistry* **45**, 508-510, doi:10.1021/ic0517366 (2006).
- 5 Crupi, V., Majolino, D., Paciaroni, A., Stancanelli, R. & Venuti, V. Influence of the "Host-Guest" Interactions on the Mobility of Genistein/ β -Cyclodextrin

- Inclusion Complex. *The Journal of Physical Chemistry B* **113**, 11032-11038, doi:10.1021/jp810546h (2009).
- 6 Sun, Y.-X. *et al.* Versatile Supramolecular Inclusion Complex Based on Host-Guest Interaction for Targeted Gene Delivery. *ACS Applied Materials & Interfaces* **9**, 42622-42632, doi:10.1021/acsami.7b14963 (2017).
- 7 Schofield, W. C. & Badyal, J. P. Controlled fragrant molecule release from surface-tethered cyclodextrin host-guest inclusion complexes. *ACS Appl Mater Interfaces* **3**, 2051-2056 (2011).
- 8 Goswami, S., Majumdar, A. & Sarkar, M. Painkiller Isoxicam and Its Copper Complex Can Form Inclusion Complexes with Different Cyclodextrins: A Fluorescence, Fourier Transform Infrared Spectroscopy, and Nuclear Magnetic Resonance Study. *The Journal of Physical Chemistry B* **121**, 8454-8466, doi:10.1021/acs.jpcc.7b05649 (2017).
- 9 Gangopadhyay, M. *et al.* Tuning Emission Responses of a Triphenylamine Derivative in Host-Guest Complexes and an Unusual Dynamic Inclusion Phenomenon. *The Journal of Organic Chemistry* **81**, 512-521, doi:10.1021/acs.joc.5b02353 (2016).
- 10 Patra, D., Zhang, H., Sengupta, S. & Sen, A. Dual Stimuli-Responsive, Rechargeable Micropumps via "Host-Guest" Interactions. *ACS Nano* **7**, 7674-7679, doi:10.1021/nn402173w (2013).
- 11 Du, Z., Ke, K., Chang, X., Dong, R. & Ren, B. Controlled Self-Assembly of Multiple-Responsive Superamphiphilic Polymers Based on Host-Guest Inclusions of a Modified PEG with β -Cyclodextrin. *Langmuir* **34**, 5606-5614, doi:10.1021/acs.langmuir.8b00470 (2018).
- 12 Gupta, M., Maity, D. K., Singh, M. K., Nayak, S. K. & Ray, A. K. Supramolecular Interaction of Coumarin 1 Dye with Cucurbit[7]uril as Host: Combined Experimental and Theoretical Study. *The Journal of Physical Chemistry B* **116**, 5551-5558, doi:10.1021/jp301266q (2012).

CHAPTER III

- 1 Li, C. *et al.* A green separation mode of synephrine from *Citrus aurantium* L. (Rutaceae) by nanofiltration technology. *Food Science & Nutrition* 7, 4014-4020, doi:10.1002/fsn3.1265 (2019).
- 2 Chin, E. L. *et al.* Longitudinal Transcriptomic, Proteomic, and Metabolomic Analyses of *Citrus sinensis* (L.) Osbeck Graft-Inoculated with “*Candidatus Liberibacter asiaticus*”. *Journal of Proteome Research* 19, 719-732, doi:10.1021/acs.jproteome.9b00616 (2020).
- 3 Wasan, A. A.-U. DETERMINATION OF PHENYLEPHRINE HYDROCHLORIDE IN PHARMACEUTICAL PREPARATIONS USING SPECTROPHOTOMETRIC METHOD. *Asian Journal of Pharmaceutical and Clinical Research* 12, doi:10.22159/ajpcr.2019.v12i5.32339 (2019).
- 4 Kaur, K., Jindal, R. & Jindal, D. Controlled release of vitamin B1 and evaluation of biodegradation studies of chitosan and gelatin based hydrogels. *Int J Biol Macromol* 11, 223 (2019).
- 5 Vijayalakshmi, R., Naga Sri Ramya, Y. & Dhanaraju, M. D. METHOD DEVELOPMENT FOR QUANTIFICATION OF LORATIDINE AND ALVERINE CITRATE BY VISIBLE SPECTROPHOTOMETRY. *International Journal of Pharmaceutical Sciences and Drug Research* 8, doi:10.25004/ijpsdr.2016.080307 (2016).
- 6 Xie, X. *et al.* Exposure to HBCD promotes adipogenesis both in vitro and in vivo by interfering with Wnt6 expression. *Sci Total Environ* 705, 6 (2020).
- 7 Shah, S. B. Characterization of environmentally friendly degradation of hexabromocyclododecane by a *Bacillus* strain HBCD-sjtu. *International biodeterioration & biodegradation*, 2019, doi:10.1016/j.ibiod.2019.104794 (2019).
- 8 de Moraes, J. O., Hilton, S. T. & Moraru, C. I. The effect of Pulsed Light and starch films with antimicrobials on *Listeria innocua* and the quality of sliced cheddar

- cheese during refrigerated storage. *Food Control* 112, 107134, doi:https://doi.org/10.1016/j.foodcont.2020.107134 (2020).
- 9 Xu, W. *et al.* Sodium Benzoate Attenuates Secondary Brain Injury by Inhibiting Neuronal Apoptosis and Reducing Mitochondria-Mediated Oxidative Stress in a Rat Model of Intracerebral Hemorrhage: Possible Involvement of DJ-1/Akt/IKK/NF κ B Pathway. *Frontiers in Molecular Neuroscience* 12, doi:10.3389/fnmol.2019.00105 (2019).
- 10 Albakaa, A. R. M., ahmed, M. a., mohammed, B. t. & jabbar, z. a. Development Method for Determination of Aspirin as Sodium Salicylate by UV-VIS Spectroscopy. *IOP Conference Series: Materials Science and Engineering* 571, 012104, doi:10.1088/1757-899x/571/1/012104 (2019).
- 11 Cabello, M. C., Souza, G. A., Bello, L. V. & Baader, W. J. Mechanistic Studies on the Salicylate-Catalyzed Peroxyoxalate Chemiluminescence in Aqueous Medium. *Photochemistry and Photobiology* 96, 28-36, doi:10.1111/php.13180 (2020).
- 12 Klampfer, L., Cammenga, J. r., Wisniewski, H.-G. & Nimer, S. D. Sodium Salicylate Activates Caspases and Induces Apoptosis of Myeloid Leukemia Cell Lines. *Blood* 93, 2386-2394, doi:10.1182/blood.V93.7.2386 (1999).
- 13 Rajbanshi, B. *et al.* Minimization of the dosage of food preservatives mixing with ionic liquids for controlling risky effect in human body: Physicochemical, antimicrobial and computational study. *Journal of Molecular Liquids* 282, 415-427, doi:https://doi.org/10.1016/j.molliq.2019.03.034 (2019).
- 14 Mallamace, F., Corsaro, C. & Stanley, H. E. A singular thermodynamically consistent temperature at the origin of the anomalous behavior of liquid water. *Scientific Reports* 2, 993, doi:10.1038/srep00993 (2012).
- 15 Ball, P. Water — an enduring mystery. *Nature* 452, 291-292, doi:10.1038/452291a (2008).
- 16 Baroni, L., Cenci, L., Tettamanti, M. & Berati, M. Evaluating the environmental impact of various dietary patterns combined with different food production

- systems. *European Journal of Clinical Nutrition* 61, 279-286, doi:10.1038/sj.ejcn.1602522 (2007).
- 17 Epstein, W. W. & Sweat, F. W. Dimethyl Sulfoxide Oxidations. *Chemical Reviews* 67, 247-260, doi:10.1021/cr60247a001 (1967).
- 18 Bordwell, F. G. Equilibrium acidities in dimethyl sulfoxide solution. *Accounts of Chemical Research* 21, 456-463, doi:10.1021/ar00156a004 (1988).
- 19 Chakrabarti, R. & Schutt, C. E. The enhancement of PCR amplification by low molecular-weight sulfones. *Gene* 274, 293-298, doi:https://doi.org/10.1016/S0378-1119(01)00621-7 (2001).
- 20 Pegg, D. E. in *Cryopreservation and Freeze-Drying Protocols* (eds John G. Day & Glyn N. Stacey) 39-57 (Humana Press, 2007).

CHAPTER IV

1. Bao L, Shu X, Yu M, Hou D, Cui L, Li C. Synthesis, structure, and host-guest properties of an anthracene-based macrocyclic arene. *Tetrahedron Letters* 59, 730-733 (2018).
2. Fang X, Gong F, Fang Y. Capillary Electrophoresis with Electrochemical Detection for Chiral Separation of Optical Isomers. *Analytical Chemistry* 70, 4030-4035 (1998).
3. Pal A, Gaba R, Soni S. Effect of presence of α -cyclodextrin and β -cyclodextrin on solution behavior of sulfathiazole at different temperatures: Thermodynamic and spectroscopic studies. *The Journal of Chemical Thermodynamics* 119, 102-113 (2018).
4. Tait RJ, Thompson DO, Stella VJ, Stobaugh JF. Sulfobutyl Ether .beta.-Cyclodextrin as a Chiral Discriminator for Use with Capillary Electrophoresis. *Analytical Chemistry* 66, 4013-4018 (1994).

5. Fanali S. Identification of chiral drug isomers by capillary electrophoresis. *Journal of Chromatography A* 735, 77-121 (1996).
6. Stalcup AM, Gahm KH. Application of Sulfated Cyclodextrins to Chiral Separations by Capillary Zone Electrophoresis. *Analytical Chemistry* 68, 1360-1368 (1996).
7. de Oliveira GGG, Feitosa A, Loureiro K, Fernandes AR, Souto EB, Severino P. Compatibility study of paracetamol, chlorpheniramine maleate and phenylephrine hydrochloride in physical mixtures. *Saudi Pharmaceutical Journal* 25, 99-103 (2017).
8. Shah HN, Halquist MT, Gerk PM. Direct detection of phenylephrine 3-O-sulfate in LS180 human intestinal cells using a novel hydrophilic interaction liquid chromatography (HILIC) assay. *Journal of Chromatography B* 1040, 67-72 (2017).
9. Kuan Y-C, Xu Y-B, Wang W-C, Yang M-T. Enantioselective synthesis of (R)-phenylephrine by *Serratia marcescens* BCRC10948 cells that homologously express SM_SDR. *Enzyme and Microbial Technology* 110, 14-19 (2018).
10. Kernan WN, *et al.* Phenylpropanolamine and the Risk of Hemorrhagic Stroke. *New England Journal of Medicine* 343, 1826-1832 (2000).
11. Wheaton TA, Stewart I. Biosynthesis of synephrine in citrus. *Phytochemistry* 8, 85-92 (1969).
12. Tette PAS, Guidi LR, Bastos Emaf, Fernandes C, Gloria MBA. Synephrine - A potential biomarker for orange honey authenticity. *Food Chem* 229, 527-533 (2017).
13. Arai K, Jin D, Kusu F, Takamura K. Determination of p-hydroxymandelic acid enantiomers in urine by high-performance liquid chromatography with electrochemical detection. *Journal of Pharmaceutical and Biomedical Analysis* 15, 1509-1514 (1997).

14. Wheaton TA, Stewart I. Feruloylputrescine : Isolation and Identification from Citrus Leaves and Fruit. *Nature* 206, 620 (1965).
15. M. Vieira S, H. Theodoro K, Gloria MBA. *Profile and levels of bioactive amines in orange juice and orange soft drink* (2007).
16. Vieira S, Calado R, Coelho H, Serôdio J. *Vieira et al 2009 MarBiol* (2012).
17. Gregory PJ. Evaluation of the Stimulant Content of Dietary Supplements Marketed as “Ephedra-Free”. *Journal of Herbal Pharmacotherapy* 7, 65-72 (2007).
18. Hallas J, Bjerrum L, Støvring H, Andersen M. Use of a Prescribed Ephedrine/Caffeine Combination and the Risk of Serious Cardiovascular Events: A Registry-based Case-Crossover Study. *American Journal of Epidemiology* 168, 966-973 (2008).
19. Vatsavai LK, Kilari EK. Interaction of p-synephrine on the pharmacodynamics and pharmacokinetics of gliclazide in animal models. *Journal of Ayurveda and Integrative Medicine*, (2017).
20. Dragull K, Breksa Ap 3rd Fau - Cain B, Cain B. Synephrine content of juice from Satsuma mandarins (*Citrus unshiu* Marcovitch).
21. Venkata Giri Kumar P, Deshpande S, Joshi A, More P, Nagendra HR. Significance of arterial stiffness in Tridosha analysis: A pilot study. *Journal of Ayurveda and Integrative Medicine* 8, 252-256 (2017).
22. Artiss JD, Brogan K Fau - Brucal M, Brucal M Fau - Moghaddam M, Moghaddam M Fau - Jen KLC, Jen KL. The effects of a new soluble dietary fiber on weight gain and selected blood parameters in rats.
23. Comerford KB, Artiss JD, Jen KL, Karakas SE. The beneficial effects of alpha-cyclodextrin on blood lipids and weight loss in healthy humans. *Obesity* 19, 1200-1204 (2011).
24. Job P. *Formation and stability of inorganic complexes in solution* (1928).

25. Renny JS, Tomasevich LL, Tallmadge EH, Collum DB. Method of continuous variations: applications of job plots to the study of molecular associations in organometallic chemistry. *Angew Chem Int Ed Engl* 52, 11998-12013 (2013).
26. Brynn Hibbert D, Thordarson P. The death of the Job plot, transparency, open science and online tools, uncertainty estimation methods and other developments in supramolecular chemistry data analysis. *Chemical Communications* 52, 12792-12805 (2016).
27. Ulatowski F, Dąbrowa K, Bałakier T, Jurczak J. Recognizing the Limited Applicability of Job Plots in Studying Host–Guest Interactions in Supramolecular Chemistry. *The Journal of Organic Chemistry* 81, 1746-1756 (2016).
28. Caso JV, *et al.* Investigating the inclusion properties of aromatic amino acids complexing beta-cyclodextrins in model peptides.
29. Gao Y, Zhao X Fau - Dong B, Dong B Fau - Zheng L, Zheng L Fau - Li N, Li N Fau - Zhang S, Zhang S. Inclusion complexes of beta-cyclodextrin with ionic liquid surfactants.
30. Piñeiro Á, *et al.* On the Characterization of Host–Guest Complexes: Surface Tension, Calorimetry, and Molecular Dynamics of Cyclodextrins with a Non-ionic Surfactant. *The Journal of Physical Chemistry B* 111, 4383-4392 (2007).
31. Saha S, Roy A, Roy K, Roy MN. Study to explore the mechanism to form inclusion complexes of β -cyclodextrin with vitamin molecules. *Scientific Reports* 6, 35764 (2016).
32. Roy MN, Saha S, Barman S, Ekka D. Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods. *RSC Advances* 6, 8881-8891 (2016).
33. Roy MN, Ekka D, Saha S, Chandra Roy M. Host-guest inclusion complexes of [small alpha] and [small beta]-cyclodextrins with [small alpha]-amino acids. *RSC Advances* 4, 42383-42390 (2014).

34. Ghosh R, Ekka D, Rajbanshi B, Yasmin A, Roy MN. Synthesis, characterization of 1-butyl-4-methylpyridinium lauryl sulfate and its inclusion phenomenon with β -cyclodextrin for enhanced applications. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 548, 206-217 (2018).
35. Gao Y, Zhao X, Dong B, Zheng L, Li N, Zhang S. Inclusion complexes of beta-cyclodextrin with ionic liquid surfactants. *J Phys Chem B* 110, 8576-8581 (2006).
36. Roy A, Saha S, Datta B, Roy MN. Insertion behavior of imidazolium and pyrrolidinium based ionic liquids into [small alpha] and [small beta]-cyclodextrins: mechanism and factors leading to host-guest inclusion complexes. *RSC Advances* 6, 100016-100027 (2016).
37. Roy MN, Saha S, Kundu M, Saha BC, Barman S. Exploration of inclusion complexes of neurotransmitters with β -cyclodextrin by physicochemical techniques. *Chemical Physics Letters* 655-656, 43-50 (2016).
38. Roy MN, Roy A, Saha S. Probing inclusion complexes of cyclodextrins with amino acids by physicochemical approach. *Carbohydrate Polymers* 151, 458-466 (2016).
39. Saha S, Ray T, Basak S, Roy MN. NMR, surface tension and conductivity studies to determine the inclusion mechanism: thermodynamics of host-guest inclusion complexes of natural amino acids in aqueous cyclodextrins. *New Journal of Chemistry* 40, 651-661 (2016).
40. Barman BK, Rajbanshi B, Yasmin A, Roy MN. Exploring inclusion complexes of ionic liquids with α - and β - cyclodextrin by NMR, IR, mass, density, viscosity, surface tension and conductance study. *Journal of Molecular Structure* 1159, 205-215 (2018).
41. Roy PM, Saha S, Barman S, Ekka DD. *Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods* (2016).

42. Cramer F, Saenger W, Spatz HC. Inclusion Compounds. XIX.1a The Formation of Inclusion Compounds of α -Cyclodextrin in Aqueous Solutions. Thermodynamics and Kinetics. *Journal of the American Chemical Society* 89, 14-20 (1967).
43. Roy MN, Saha S, Barman S, Ekka D. Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods. *RSC Advances* 6, 8881-8891 (2016).
44. Benesi HA, Hildebrand JH. A Spectrophotometric Investigation of the Interaction of Iodine with Aromatic Hydrocarbons. *Journal of the American Chemical Society* 71, 2703-2707 (1949).
45. Caso JV, *et al.* Investigating the inclusion properties of aromatic amino acids complexing beta-cyclodextrins in model peptides. *Amino Acids* 47, 2215-2227 (2015).
46. Thordarson P. Determining association constants from titration experiments in supramolecular chemistry. *Chem Soc Rev* 40, 1305-1323 (2011).
47. Connors KA. The Stability of Cyclodextrin Complexes in Solution. *Chemical Reviews* 97, 1325-1358 (1997).
48. Szejtli J. Introduction and General Overview of Cyclodextrin Chemistry. *Chemical Reviews* 98, 1743-1754 (1998).
49. Evans DF, Matesich SMA. Ionic association in hydrogen-bonding solvents. *Journal of Solution Chemistry* 2, 193-216 (1973).
50. Khayatian G, Shariati S, Shamsipur M. Conductance Study of the Thermodynamics of Binding of Some Macrocyclic Polyethers with Tl⁺ Ion in Dimethylformamide-Acetonitrile Mixtures. *Journal of inclusion phenomena and macrocyclic chemistry* 45, 117-121 (2003).
51. de Namor AFD, Ritt M-C, Schwing-Weill M-J, Arnaud-Neu F, Lewis DFV. Solution thermodynamics of amino acid-18-crown-6 and amino acid-cryptand 222 complexes in methanol and ethanol. Linear enthalpy-entropy compensation

- effect. *Journal of the Chemical Society, Faraday Transactions* 87, 3231-3239 (1991).
52. Prabu S, Swaminathan M, Sivakumar K, Rajamohan R. Preparation, characterization and molecular modeling studies of the inclusion complex of Caffeine with Beta-cyclodextrin. *Journal of Molecular Structure* 1099, 616-624 (2015).
53. Sanramé CN, de Rossi RH, Argüello GA. Effect of β -Cyclodextrin on the Excited State Properties of 3-Substituted Indole Derivatives. *The Journal of Physical Chemistry* 100, 8151-8156 (1996).
54. Oana M, Tintaru A, Gavrilu D, Maior O, Hillebrand M. Spectral Study and Molecular Modeling of the Inclusion Complexes of β -Cyclodextrin with Some Phenoxathiin Derivatives. *The Journal of Physical Chemistry B* 106, 257-263 (2002).
55. Zhang Q-F, Jiang Z-T, Guo Y-X, Li R. Complexation study of brilliant cresyl blue with β -cyclodextrin and its derivatives by UV-vis and fluorospectrometry. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 69, 65-70 (2008).
56. Zhang M, Li J, Jia W, Chao J, Zhang L. Theoretical and experimental study of the inclusion complexes of ferulic acid with cyclodextrins. *Supramolecular Chemistry* 21, 597-602 (2009).
57. Sindelar V, Cejas Ma Fau - Raymo FM, Raymo Fm Fau - Chen W, Chen W Fau - Parker SE, Parker Se Fau - Kaifer AE, Kaifer AE. Supramolecular assembly of 2,7-dimethyldiazapyrenium and cucurbit[8]uril: a new fluorescent host for detection of catechol and dopamine.
58. Yang LJ, *et al.* Preparation and characterization of inclusion complexes of naringenin with beta-cyclodextrin or its derivative. *Carbohydr Polym* 98, 861-869 (2013).

59. Fernandes A, *et al.* Structural characterization of inclusion complexes between cyanidin-3-O-glucoside and β -cyclodextrin. *Carbohydrate Polymers* 102, 269-277 (2014).
60. Xiao CF, *et al.* Investigation of inclusion complex of epothilone A with cyclodextrins.
61. Yang B, Lin J, Chen Y, Liu Y. Artemether/hydroxypropyl-beta-cyclodextrin host-guest system: characterization, phase-solubility and inclusion mode. *Bioorg Med Chem* 17, 6311-6317 (2009).
62. Servais AC, *et al.* Capillary electrophoretic and nuclear magnetic resonance studies on the opposite affinity pattern of propranolol enantiomers towards various cyclodextrins.
63. Correia I, Bezzenine N, Ronzani N, Platzner N, Beloeil JC, Doan BT. Study of inclusion complexes of acridine with β - and (2,6-di-O-methyl)- β -cyclodextrin by use of solubility diagrams and NMR spectroscopy. *Journal of Physical Organic Chemistry* 15, 647-659 (2002).
64. Bednarek E, Bocian W, Poznanski J, Sitkowski J, Sadlej-Sosnowska N, Kozerski L. Complexation of steroid hormones: prednisolone, ethinyloestradiol and estriol with [small beta]-cyclodextrin. An aqueous ^1H NMR study. *Journal of the Chemical Society, Perkin Transactions 2*, 999-1004 (2002).
65. Ishizu T, Hirata C, Yamamoto H, Harano K. Structure and intramolecular flexibility of β -cyclodextrin complex with (-)-epigallocatechin gallate in aqueous solvent. *Magnetic Resonance in Chemistry* 44, 776-783 (2006).
66. Kemelbekov U, *et al.* IR, UV and NMR studies of β -cyclodextrin inclusion complexes of kazcaine and prosidol bases. *Journal of inclusion phenomena and macrocyclic chemistry* 69, 181-190 (2011).
67. Stalin T, Srinivasan K, Sivakumar K, Radhakrishnan S. Preparation and characterizations of solid/aqueous phases inclusion complex of 2,4-dinitroaniline with beta-cyclodextrin.

68. Zhang JQ, *et al.* Novel water-soluble fisetin/cyclodextrins inclusion complexes: Preparation, characterization, molecular docking and bioavailability. *Carbohydr Res* 418, 20-28 (2015).
69. Okada Y, Ueyama K, Nishikawa J-i, Semma M, Ichikawa A. *Effect of 6-O- α -maltosyl- β cyclodextrin and its cholesterol inclusion complex on cellular cholesterol levels and ABCA1 and ABCG1 expression in mouse mastocytoma P-815 cells* (2012).
70. Sivakumar K, Ragi TR, Prema D, Stalin T. Experimental and theoretical investigation on the structural characterization and orientation preferences of 2-hydroxy-1-naphthoic acid/ β -cyclodextrin host-guest inclusion complex. *Journal of Molecular Liquids* 218, 538-548 (2016).
71. Negi JS, Singh S. Spectroscopic investigation on the inclusion complex formation between amisulpride and gamma-cyclodextrin. *Carbohydr Polym* 92, 1835-1843 (2013).
72. Zhang W, *et al.* Investigation of water-soluble inclusion complex of hypericin with β -cyclodextrin polymer. *Carbohydrate Polymers* 95, 366-370 (2013).
73. Vesterdal J. The Agar Cup Method for the Estimation of Penicillin*). *Acta Pharmacologica et Toxicologica* 2, 9-21 (1946).
74. Di Donato C, *et al.* Alpha- and Beta-Cyclodextrin Inclusion Complexes with 5-Fluorouracil: Characterization and Cytotoxic Activity Evaluation. *Molecules* 21, (2016).

CHAPTER V

- 1 Rodríguez-López, M. I. *et al.* Thorough characterization and stability of HP- β -cyclodextrin thymol inclusion complexes prepared by microwave technology: A required approach to a successful application in food industry. *Journal of the Science of Food and Agriculture* 99, 1322-1333, doi:10.1002/jsfa.9307 (2019).

- 2 Kfoury, M., Geagea, C., Ruellan, S., Greige-Gerges, H. & Fourmentin, S. Effect of cyclodextrin and cosolvent on the solubility and antioxidant activity of caffeic acid. *Food Chemistry* 278, 163-169, doi:<https://doi.org/10.1016/j.foodchem.2018.11.055> (2019).
- 3 Mourtzinou, I. *et al.* Natural food colorants derived from onion wastes: Application in a yoghurt product. *ELECTROPHORESIS* 39, 1975-1983, doi:10.1002/elps.201800073 (2018).
- 4 Bakirhan, N. K., Tok, T. T. & Ozkan, S. A. The redox mechanism investigation of non-small cell lung cancer drug: Erlotinib via theoretical and experimental techniques and its host-guest detection by β -Cyclodextrin nanoparticles modified glassy carbon electrode. *Sensors and Actuators B: Chemical* 278, 172-180, doi:<https://doi.org/10.1016/j.snb.2018.09.090> (2019).
- 5 Saidman, E. *et al.* Inclusion complexes of β -cyclodextrin and polymorphs of mebendazole: Physicochemical characterization. *European Journal of Pharmaceutical Sciences* 127, 330-338, doi:<https://doi.org/10.1016/j.ejps.2018.11.012> (2019).
- 6 Singh, N. & Sahu, O. in *The Impact and Prospects of Green Chemistry for Textile Technology* (eds Islam Shahid ul & B. S. Butola) 83-105 (Woodhead Publishing, 2019).
- 7 Cao, S. *et al.* A high efficient adsorbent for plant growth regulators based on ionic liquid and β -cyclodextrin functionalized magnetic graphene oxide. *Talanta* 194, 14-25, doi:<https://doi.org/10.1016/j.talanta.2018.10.013> (2019).
- 8 Strokopytov, B. *et al.* X-ray Structure of Cyclodextrin Glycosyltransferase Complexed with Acarbose. Implications for the Catalytic Mechanism of Glycosidases. *Biochemistry* 34, 2234-2240, doi:10.1021/bi00007a018 (1995).
- 9 Cai, L., Jeremic, D., Lim, H. & Kim, Y. β -Cyclodextrins as sustained-release carriers for natural wood preservatives. *Industrial Crops and Products* 130, 42-48, doi:<https://doi.org/10.1016/j.indcrop.2018.12.061> (2019).

- 10 Bardi, L., Mattei, A., Steffan, S. & Marzona, M. Hydrocarbon degradation by a soil microbial population with β -cyclodextrin as surfactant to enhance bioavailability. *Enzyme and Microbial Technology* 27, 709-713, doi:[https://doi.org/10.1016/S0141-0229\(00\)00275-1](https://doi.org/10.1016/S0141-0229(00)00275-1) (2000).
- 11 Bellringer, M. E., Smith, T. G., Read, R., Gopinath, C. & Olivier, P. β -Cyclodextrin: 52-Week toxicity studies in the rat and dog. *Food and Chemical Toxicology* 33, 367-376, doi:[https://doi.org/10.1016/0278-6915\(94\)00149-I](https://doi.org/10.1016/0278-6915(94)00149-I) (1995).
- 12 Jalalvandi, E. & Shavandi, A. Shear thinning/self-healing hydrogel based on natural polymers with secondary photocrosslinking for biomedical applications. *Journal of the Mechanical Behavior of Biomedical Materials* 90, 191-201, doi:<https://doi.org/10.1016/j.jmbbm.2018.10.009> (2019).
- 13 Myszka, K., Leja, K. & Majcher, M. A current opinion on the antimicrobial importance of popular pepper essential oil and its application in food industry. *Journal of Essential Oil Research* 31, 1-18, doi:[10.1080/10412905.2018.1511482](https://doi.org/10.1080/10412905.2018.1511482) (2019).
- 14 Sayed, M., Gubbala, G. K. & Pal, H. Contrasting interactions of DNA-intercalating dye acridine orange with hydroxypropyl derivatives of β -cyclodextrin and γ -cyclodextrin hosts. *New Journal of Chemistry* 43, 724-736, doi:[10.1039/c8nj04067b](https://doi.org/10.1039/c8nj04067b) (2019).
- 15 Saekhor, K., Udomsinprasert, W., Honsawek, S. & Tachaboonyakiat, W. Preparation of an injectable modified chitosan-based hydrogel approaching for bone tissue engineering. *International Journal of Biological Macromolecules* 123, 167-173, doi:<https://doi.org/10.1016/j.ijbiomac.2018.11.041> (2019).
- 16 van de Manakker, F., Vermonden, T., van Nostrum, C. F. & Hennink, W. E. Cyclodextrin-Based Polymeric Materials: Synthesis, Properties, and Pharmaceutical/Biomedical Applications. *Biomacromolecules* 10, 3157-3175, doi:[10.1021/bm901065f](https://doi.org/10.1021/bm901065f) (2009).
- 17 Mejías, F. J. R. *et al.* Provitamin supramolecular polymer micelle with pH responsiveness to control release, bioavailability enhancement and

- potentiation of cytotoxic efficacy. *Colloids and Surfaces B: Biointerfaces* 173, 85-93, doi:<https://doi.org/10.1016/j.colsurfb.2018.09.057> (2019).
- 18 Li, Y. *et al.* Digestion properties of corn starch modified by α -D-glucan branching enzyme and cyclodextrin glycosyltransferase. *Food Hydrocolloids* 89, 534-541, doi:<https://doi.org/10.1016/j.foodhyd.2018.11.025> (2019).
- 19 Wang, P. *et al.* Effects of β -cyclodextrin on the enzymatic hydrolysis of hemp seed oil by lipase *Candida sp.* 99–125. *Industrial Crops and Products* 129, 688-693, doi:<https://doi.org/10.1016/j.indcrop.2018.11.046> (2019).
- 20 Rajbanshi, B. *et al.* Study to Probe Subsistence of Host-Guest Inclusion Complexes of α and β -Cyclodextrins with Biologically Potent Drugs for Safety Regulatory Discharge. *Scientific Reports* 8, 13031, doi:10.1038/s41598-018-31373-x (2018).
- 21 Yin, Y. & Cadwallader, K. R. Spray-chilling encapsulation of 2-acetyl-1-pyrroline zinc chloride using hydrophobic materials: Storage stability and flavor application in food. *Food Chemistry* 278, 738-743, doi:<https://doi.org/10.1016/j.foodchem.2018.11.122> (2019).
- 22 Zhang, G., Yuan, C. & Sun, Y. Effect of Selective Encapsulation of Hydroxypropyl- β -cyclodextrin on Components and Antibacterial Properties of Star Anise Essential Oil. *Molecules* 23, doi:10.3390/molecules23051126 (2018).
- 23 Beserra-Filho, J. I. A. *et al.* *Eplingiella fruticosa* leaf essential oil complexed with β -cyclodextrin produces a superior neuroprotective and behavioral profile in a mice model of Parkinson's disease. *Food and Chemical Toxicology* 124, 17-29, doi:<https://doi.org/10.1016/j.fct.2018.11.056> (2019).
- 24 Chowdhury, P. *et al.* Tannic acid-inspired paclitaxel nanoparticles for enhanced anticancer effects in breast cancer cells. *Journal of Colloid and Interface Science* 535, 133-148, doi:<https://doi.org/10.1016/j.jcis.2018.09.072> (2019).

- 25 Feng, T. *et al.* Associated-Extraction Efficiency of Six Cyclodextrins on Various Flavonoids in *Puerariae Lobatae Radix*. *Molecules* 24, doi:10.3390/molecules24010093 (2018).
- 26 Ho, S., Thoo, Y. Y., Young, D. J. & Siow, L. F. Stability and recovery of cyclodextrin encapsulated catechin in various food matrices. *Food Chemistry* 275, 594-599, doi:https://doi.org/10.1016/j.foodchem.2018.09.117 (2019).
- 27 Gan, R.-Y. *et al.* in *Sprouted Grains* (eds Hao Feng, Boris Nemzer, & Jonathan W. DeVries) 191-246 (AACC International Press, 2019).
- 28 Pinela, J. *et al.* Stability of total folates/vitamin B9 in irradiated watercress and buckler sorrel during refrigerated storage. *Food Chemistry* 274, 686-690, doi:https://doi.org/10.1016/j.foodchem.2018.09.042 (2019).
- 29 Yu, Y. *et al.* Saccharomyces-derived carbon dots for biosensing pH and vitamin B 12. *Talanta* 195, 117-126, doi:https://doi.org/10.1016/j.talanta.2018.11.010 (2019).
- 30 Oliveira, C. H. d. M., Assaid Simão, A. & Marcussi, S. Inhibitory effects of ascorbic acid, vitamin E, and vitamin B-complex on the biological activities induced by Bothrops venom. *Pharmaceutical Biology* 54, 845-852, doi:10.3109/13880209.2015.1087038 (2016).
- 31 Li, S. *et al.* Encapsulation of Vitamin B1 and Its Phosphate Derivatives by Cucurbit[7]uril: Tunability of the Binding Site and Affinity by the Presence of Phosphate Groups. *The Journal of Organic Chemistry* 81, 1300-1303, doi:10.1021/acs.joc.5b02666 (2016).
- 32 Li, X. *et al.* Measurement of Solubility of Thiamine Hydrochloride Hemihydrate in Three Binary Solvents and Mixing Properties of Solutions. *Journal of Chemical & Engineering Data* 61, 3665-3678, doi:10.1021/acs.jced.6b00613 (2016).
- 33 Islam, M. S. *et al.* Effect of UV Irradiation on the Nutritional Quality and Cytotoxicity of Apple Juice. *Journal of Agricultural and Food Chemistry* 64, 7812-7822, doi:10.1021/acs.jafc.6b02491 (2016).

- 34 Brasky, T. M., White, E. & Chen, C.-L. Long-Term, Supplemental, One-Carbon Metabolism-Related Vitamin B Use in Relation to Lung Cancer Risk in the Vitamins and Lifestyle (VITAL) Cohort. *Journal of Clinical Oncology* 35, 3440-3448, doi:10.1200/jco.2017.72.7735 (2017).
- 35 Abo Dena, A. S. & Ammar, A. A. H-point standard addition for simultaneous reagent-free spectrophotometric determination of B1 and B6 vitamins. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 206, 491-497, doi:https://doi.org/10.1016/j.saa.2018.08.047 (2019).
- 36 Slawson, D. L., Fitzgerald, N. & Morgan, K. T. Position of the Academy of Nutrition and Dietetics: The Role of Nutrition in Health Promotion and Chronic Disease Prevention. *Journal of the Academy of Nutrition and Dietetics* 113, 972-979, doi:10.1016/j.jand.2013.05.005 (2013).
- 37 Aloysius, A., Ramanathan, R., Christy, A., Baskaran, S. & Antony, N. Experimental and theoretical studies on the corrosion inhibition of vitamins - Thiamine hydrochloride or biotin in corrosion of mild steel in aqueous chloride environment. *Egyptian Journal of Petroleum* 27, 371-381, doi:https://doi.org/10.1016/j.ejpe.2017.06.003 (2018).
- 38 Crook, M. A. in *Laboratory Assessment of Vitamin Status* (ed Dominic Harrington) 149-164 (Academic Press, 2019).
- 39 Nath, A., Tran, T., Shope, T. R. & Koch, T. R. Prevalence of clinical thiamine deficiency in individuals with medically complicated obesity. *Nutrition Research* 37, 29-36, doi:https://doi.org/10.1016/j.nutres.2016.11.012 (2017).
- 40 Abdou, E. & Hazell, A. S. Thiamine deficiency: an update of pathophysiologic mechanisms and future therapeutic considerations. *Neurochem Res* 40, 353-361 (2015).
- 41 Yang, Y., Han, D., Du, S., Wu, S. & Gong, J. Crystal morphology optimization of thiamine hydrochloride in solvent system: Experimental and molecular dynamics simulation studies. *Journal of Crystal Growth* 481, 48-55, doi:https://doi.org/10.1016/j.jcrysgro.2017.10.022 (2018).

- 42 Voelker, A. L., Miller, J., Running, C. A., Taylor, L. S. & Mauer, L. J. Chemical stability and reaction kinetics of two thiamine salts (thiamine mononitrate and thiamine chloride hydrochloride) in solution. *Food Research International* 112, 443-456, doi:<https://doi.org/10.1016/j.foodres.2018.06.056> (2018).
- 43 Struch, N., Topić, F., Rissanen, K. & Lützen, A. Electron-deficient trifluoromethyl-substituted sub-components affect the properties of M4L4 tetrahedral cages. *Dalton Transactions* 46, 10809-10813, doi:10.1039/c7dt02182h (2017).
- 44 Zhu, T., Du, J., Cao, W., Fan, J. & Peng, X. Microenvironment-Sensitive Fluorescent Dyes for Recognition of Serum Albumin in Urine and Imaging in Living Cells. *Industrial & Engineering Chemistry Research* 55, 527-533, doi:10.1021/acs.iecr.5b04214 (2016).
- 45 Bolattin, M. B., Nandibewoor, S. T., Joshi, S. D., Dixit, S. R. & Chimatadar, S. A. Interaction of Hydralazine with Human Serum Albumin and Effect of β -Cyclodextrin on Binding: Insights from Spectroscopic and Molecular Docking Techniques. *Industrial & Engineering Chemistry Research* 55, 5454-5464, doi:10.1021/acs.iecr.6b00517 (2016).
- 46 Suryawanshi, V. D., Anbhule, P. V., Gore, A. H., Patil, S. R. & Kolekar, G. B. Spectroscopic Investigation on the Interaction of Pyrimidine Derivative, 2-Amino-6-hydroxy-4-(3,4-dimethoxyphenyl)-pyrimidine-5-carbonitrile with Human Serum Albumin: Mechanistic and Conformational Study. *Industrial & Engineering Chemistry Research* 51, 95-102, doi:10.1021/ie202005c (2012).
- 47 Weiss-Errico, M. J., Miksovská, J. & O'Shea, K. E. β -Cyclodextrin Reverses Binding of Perfluorooctanoic Acid to Human Serum Albumin. *Chemical Research in Toxicology* 31, 277-284, doi:10.1021/acs.chemrestox.8b00002 (2018).
- 48 Wang, L. *et al.* The influence of hydroxypropyl- β -cyclodextrin on the solubility, dissolution, cytotoxicity, and binding of riluzole with human serum albumin. *Journal of Pharmaceutical and Biomedical Analysis* 117, 453-463, doi:<https://doi.org/10.1016/j.jpba.2015.09.033> (2016).

- 49 Sarbadhikary, P. & Dube, A. Spectroscopic investigations on the binding of an iodinated chlorin p6-copper complex to human serum albumin. *Photochemical & Photobiological Sciences* 16, 1762-1770, doi:10.1039/c7pp00197e (2017).
- 50 Martin, C., Cohen, B., Gaamoussi, I., Ijjaali, M. & Douhal, A. Ultrafast Dynamics of C30 in Solution and within CDs and HSA Protein. *The Journal of Physical Chemistry B* 118, 5760-5771, doi:10.1021/jp5026575 (2014).
- 51 Cohen, B., Martín Álvarez, C., Alarcos Carmona, N., Organero, J. A. & Douhal, A. Proton-Transfer Reaction Dynamics within the Human Serum Albumin Protein. *The Journal of Physical Chemistry B* 115, 7637-7647, doi:10.1021/jp200294q (2011).
- 52 Moulin, V., Grandoni, F., Castioni, J. & Lu, H. Pancytopenia in an adult patient with thiamine-responsive megaloblastic anaemia. *BMJ Case Reports* 2018, bcr-2018-225035, doi:10.1136/bcr-2018-225035 (2018).
- 53 Wrenn, K. D., Murphy, F. & Slovis, C. M. A toxicity study of parenteral thiamine hydrochloride. *Annals of Emergency Medicine* 18, 867-870, doi:https://doi.org/10.1016/S0196-0644(89)80215-X (1989).
- 54 Chern, C.-H., Chern, T.-L., Hu, S.-C., Lee, C.-H. & Deng, J.-F. Complete and partial response to flumazenil in patients with suspected benzodiazepine overdose. *The American Journal of Emergency Medicine* 13, 372-375, doi:https://doi.org/10.1016/0735-6757(95)90222-8 (1995).
- 55 Kumar, R. *et al.* Pyrene appended bis-triazolylated 1,4-dihydropyridine as a selective fluorogenic sensor for Cu²⁺. *Dyes and Pigments* 161, 162-171, doi:https://doi.org/10.1016/j.dyepig.2018.09.049 (2019).
- 56 Ulatowski, F., Dąbrowa, K., Bałakier, T. & Jurczak, J. Recognizing the Limited Applicability of Job Plots in Studying Host–Guest Interactions in Supramolecular Chemistry. *The Journal of Organic Chemistry* 81, 1746-1756, doi:10.1021/acs.joc.5b02909 (2016).

- 57 dos Santos, C. H., Uchiyama, N. M. & Bagatin, I. A. Selective azo dye-based colorimetric chemosensor for F⁻, CH₃COO⁻ and PO₄³⁻. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 210, 355-361, doi:<https://doi.org/10.1016/j.saa.2018.11.057> (2019).
- 58 Thordarson, P. Determining association constants from titration experiments in supramolecular chemistry. *Chemical Society Reviews* 40, 1305-1323, doi:[10.1039/c0cs00062k](https://doi.org/10.1039/c0cs00062k) (2011).
- 59 Yuan, L. *et al.* Studies on the preparation and photostability of avobenzene and (2-hydroxy)propyl- β -cyclodextrin inclusion complex. *Journal of Photochemistry and Photobiology A: Chemistry* 369, 174-180, doi:<https://doi.org/10.1016/j.jphotochem.2018.09.036> (2019).
- 60 Bartolotta, M. & Buthelezi, M. T. Molecular polarity effect on the association constant of cyclodextrin-pyrimidine nucleobases in water. *Journal of Photochemistry and Photobiology A: Chemistry* 371, 382-386, doi:<https://doi.org/10.1016/j.jphotochem.2018.11.037> (2019).
- 61 Moncada-Basualto, M. *et al.* Supramolecular hydrogels of β -cyclodextrin linked to calcium homopoly-l-gulonate for release of coumarins with trypanocidal activity. *Carbohydrate Polymers* 204, 170-181, doi:<https://doi.org/10.1016/j.carbpol.2018.10.010> (2019).
- 62 KiranKumar, H. N., RohitKumar, H. G. & Advirao, G. M. Synthesis, DNA binding and cytotoxic activity of pyrimido[4',5':4,5]thieno(2,3-b)quinoline with 9-hydroxy-4-(3-diethylaminopropylamino) and 8-methoxy-4-(3-diethylaminopropylamino) substitutions. *Journal of Photochemistry and Photobiology B: Biology* 178, 1-9, doi:<https://doi.org/10.1016/j.jphotobiol.2017.10.022> (2018).
- 63 Connors, K. A. & Pendergast, D. D. Microscopic binding constants in cyclodextrin systems: complexation of α -cyclodextrin with sym-1,4-disubstituted benzenes. *Journal of the American Chemical Society* 106, 7607-7614, doi:[10.1021/ja00336a048](https://doi.org/10.1021/ja00336a048) (1984).

- 64 Saha, S., Roy, A. & Roy, M. N. Mechanistic Investigation of Inclusion Complexes of a Sulfa Drug with α - and β -Cyclodextrins. *Industrial & Engineering Chemistry Research* 56, 11672-11683, doi:10.1021/acs.iecr.7b02619 (2017).
- 65 Saha, S., Roy, A., Roy, K. & Roy, M. N. Study to explore the mechanism to form inclusion complexes of β -cyclodextrin with vitamin molecules. *Scientific Reports* 6, 35764, doi:10.1038/srep35764
<https://www.nature.com/articles/srep35764#supplementary-information> (2016).
- 66 Geng, Q. *et al.* Preparation and Characterization of Butachlor/(2-Hydroxypropyl)- β -cyclodextrin Inclusion Complex: Improve Soil Mobility and Herbicidal Activity and Decrease Fish Toxicity. *Journal of Agricultural and Food Chemistry* 66, 12198-12205, doi:10.1021/acs.jafc.8b04812 (2018).
- 67 Sancho, M. I. *et al.* Physicochemical Characterization of 2-Hydroxybenzophenone with β -Cyclodextrin in Solution and Solid State. *The Journal of Physical Chemistry B* 119, 5918-5925, doi:10.1021/acs.jpcc.5b01742 (2015).
- 68 Sherje, A. P. *et al.* Inclusion Complexation of Etodolac with Hydroxypropyl-beta-cyclodextrin and Auxiliary Agents: Formulation Characterization and Molecular Modeling Studies. *Molecular Pharmaceutics* 14, 1231-1242, doi:10.1021/acs.molpharmaceut.6b01115 (2017).
- 69 do Nascimento Cavalcante, A. *et al.* Elaboration and characterization of the inclusion complex between β -cyclodextrin and the anticholinesterase 2-oleyl-1,3-dipalmitoyl-glycerol extracted from the seeds of *Platonia insignis* MART. *Journal of Molecular Structure* 1177, 286-301, doi:<https://doi.org/10.1016/j.molstruc.2018.09.067> (2019).
- 70 Barman, B. K., Barman, S. & Roy, M. N. Inclusion complexation between tetrabutylphosphonium methanesulfonate as guest and α - and β -cyclodextrin as hosts investigated by physicochemical methodology. *Journal of Molecular Liquids* 264, 80-87, doi:<https://doi.org/10.1016/j.molliq.2018.04.148> (2018).

- 71 Aytac, Z. *et al.* Fast-Dissolving, Prolonged Release, and Antibacterial Cyclodextrin/Limonene-Inclusion Complex Nanofibrous Webs via Polymer-Free Electrospinning. *Journal of Agricultural and Food Chemistry* 64, 7325-7334, doi:10.1021/acs.jafc.6b02632 (2016).
- 72 Guo, H. *et al.* Photoresponsive self-assembly of a β -cyclodextrin derivative with an azobenzene terminal group in water. *Dyes and Pigments* 149, 626-632, doi:https://doi.org/10.1016/j.dyepig.2017.11.035 (2018).
- 73 Celebioglu, A. & Uyar, T. Antioxidant Vitamin E/Cyclodextrin Inclusion Complex Electrospun Nanofibers: Enhanced Water Solubility, Prolonged Shelf Life, and Photostability of Vitamin E. *Journal of Agricultural and Food Chemistry* 65, 5404-5412, doi:10.1021/acs.jafc.7b01562 (2017).
- 74 Gong, L. *et al.* An inclusion complex of eugenol into β -cyclodextrin: Preparation, and physicochemical and antifungal characterization. *Food Chemistry* 196, 324-330, doi:https://doi.org/10.1016/j.foodchem.2015.09.052 (2016).
- 75 Ikeda, H. *et al.* Fluorescent Cyclodextrins for Molecule Sensing: Fluorescent Properties, NMR Characterization, and Inclusion Phenomena of N-Dansylleucine-Modified Cyclodextrins. *Journal of the American Chemical Society* 118, 10980-10988, doi:10.1021/ja960183i (1996).
- 76 Banerjee, A. & Sengupta, P. K. Encapsulation of 3-hydroxyflavone and fisetin in β -cyclodextrins: Excited state proton transfer fluorescence and molecular mechanics studies. *Chemical Physics Letters* 424, 379-386, doi:https://doi.org/10.1016/j.cplett.2006.05.006 (2006).
- 77 Chaudhuri, S., Chakraborty, S. & Sengupta, P. K. Encapsulation of serotonin in β -cyclodextrin nano-cavities: Fluorescence spectroscopic and molecular modeling studies. *Journal of Molecular Structure* 975, 160-165, doi:https://doi.org/10.1016/j.molstruc.2010.04.014 (2010).
- 78 Sharma, U. S., Balasubramanian, S. V. & Straubinger, R. M. Pharmaceutical and Physical Properties of Paclitaxel (Taxol \dagger) Complexes with Cyclodextrins \ddagger .

- Journal of Pharmaceutical Sciences* 84, 1223-1230, doi:<https://doi.org/10.1002/jps.2600841015> (1995).
- 79 Dsouza, R. N., Pischel, U. & Nau, W. M. Fluorescent Dyes and Their Supramolecular Host/Guest Complexes with Macrocycles in Aqueous Solution. *Chemical Reviews* 111, 7941-7980, doi:10.1021/cr200213s (2011).
- 80 Naik, R. S., Pawar, S. K., Tandel, R. D. & J, S. Insights in to the mechanism of interaction of a thrombin inhibitor, dabigatran etexilate with human serum albumin and influence of β -cyclodextrin on binding: Spectroscopic and computational approach. *Journal of Molecular Liquids* 251, 119-127, doi:<https://doi.org/10.1016/j.molliq.2017.12.056> (2018).

CHAPTER VI

- 1 Marvin, C. H. *et al.* Hexabromocyclododecane: Current Understanding of Chemistry, Environmental Fate and Toxicology and Implications for Global Management. *Environmental Science & Technology* 45, 8613-8623, doi:10.1021/es201548c (2011).
- 2 Melymuk, L. *et al.* Challenges in the Analysis of Novel Flame Retardants in Indoor Dust: Results of the INTERFLAB 2 Interlaboratory Evaluation. *Environmental Science & Technology* 52, 9295-9303, doi:10.1021/acs.est.8b02715 (2018).
- 3 Mitro, S. D. *et al.* Consumer Product Chemicals in Indoor Dust: A Quantitative Meta-analysis of U.S. Studies. *Environmental Science & Technology* 50, 10661-10672, doi:10.1021/acs.est.6b02023 (2016).
- 4 Su, G., Letcher, R. J., McGoldrick, D. J. & Backus, S. M. Halogenated Flame Retardants in Predator and Prey Fish From the Laurentian Great Lakes: Age-Dependent Accumulation and Trophic Transfer. *Environmental Science & Technology* 51, 8432-8441, doi:10.1021/acs.est.7b02338 (2017).

- 5 Tay, J. H. *et al.* Human Exposure to Legacy and Emerging Halogenated Flame Retardants via Inhalation and Dust Ingestion in a Norwegian Cohort. *Environmental Science & Technology* 51, 8176-8184, doi:10.1021/acs.est.7b02114 (2017).
- 6 Ruan, Y. *et al.* Stereoisomer-Specific Trophodynamics of the Chiral Brominated Flame Retardants HBCD and TBEC in a Marine Food Web, with Implications for Human Exposure. *Environmental Science & Technology* 52, 8183-8193, doi:10.1021/acs.est.8b02206 (2018).
- 7 Nguyen, K.-H., Abou-Elwafa Abdallah, M., Moehring, T. & Harrad, S. Biotransformation of the Flame Retardant 1,2-Dibromo-4-(1,2-dibromoethyl)cyclohexane (TBEC) in Vitro by Human Liver Microsomes. *Environmental Science & Technology* 51, 10511-10518, doi:10.1021/acs.est.7b02834 (2017).
- 8 Rauert, C., Schuster, J. K., Eng, A. & Harner, T. Global Atmospheric Concentrations of Brominated and Chlorinated Flame Retardants and Organophosphate Esters. *Environmental Science & Technology* 52, 2777-2789, doi:10.1021/acs.est.7b06239 (2018).
- 9 Vorkamp, K., Falk, K., Møller, S., Rigét, F. F. & Sørensen, P. B. Regulated and Unregulated Halogenated Flame Retardants in Peregrine Falcon Eggs from Greenland. *Environmental Science & Technology* 52, 474-483, doi:10.1021/acs.est.7b04866 (2018).
- 10 Arnot, J. A. *et al.* Toward a Consistent Evaluative Framework for POP Risk Characterization. *Environmental Science & Technology* 45, 97-103, doi:10.1021/es102551d (2011).
- 11 Loganathan, B. in *Persistent Organic Chemicals in the Environment: Status and Trends in the Pacific Basin Countries I Contamination Status* Vol. 1243 *ACS Symposium Series* Ch. 1, 1-15 (American Chemical Society, 2016).
- 12 Masunaga, S., Loganathan, B. G., Khim, J. S. & Kodavanti, P. R. S. in *ACS Symposium Series* Vol. 1243 0 (American Chemical Society, 2016).

- 13 Law, R. J. *et al.* A Significant Downturn in Levels of Hexabromocyclododecane in the Blubber of Harbor Porpoises (*Phocoena phocoena*) Stranded or Bycaught in the UK: An Update to 2006. *Environmental Science & Technology* 42, 9104-9109, doi:10.1021/es8014309 (2008).
- 14 Su, G. *et al.* Isomer-Specific Hexabromocyclododecane (HBCDD) Levels in Top Predator Fish from Across Canada and 36-Year Temporal Trends in Lake Ontario. *Environmental Science & Technology* 52, 6197-6207, doi:10.1021/acs.est.8b01052 (2018).
- 15 Wang, Y. *et al.* Organophosphorus Flame Retardants and Plasticizers in Building and Decoration Materials and Their Potential Burdens in Newly Decorated Houses in China. *Environmental Science & Technology* 51, 10991-10999, doi:10.1021/acs.est.7b03367 (2017).
- 16 Dominguez-Romero, E. *et al.* Tissue Distribution and Transfer to Eggs of Ingested α -Hexabromocyclododecane (α -HBCDD) in Laying Hens (*Gallus domesticus*). *Journal of Agricultural and Food Chemistry* 64, 2112-2119, doi:10.1021/acs.jafc.5b05574 (2016).
- 17 Shi, Y. *et al.* Antioxidant gene expression and metabolic responses of earthworms (*Eisenia fetida*) after exposure to various concentrations of hexabromocyclododecane. *Environmental Pollution* 232, 245-251, doi:https://doi.org/10.1016/j.envpol.2017.09.039 (2018).
- 18 Peng, Y.-H., Chen, Y.-j., Chang, M. & Shih, Y.-h. The effect of zerovalent iron on the microbial degradation of hexabromocyclododecane. *Chemosphere* 200, 419-426, doi:https://doi.org/10.1016/j.chemosphere.2018.02.123 (2018).
- 19 Peng, X., Wei, D., Huang, Q. & Jia, X. Debromination of Hexabromocyclododecane by Anaerobic Consortium and Characterization of Functional Bacteria. *Frontiers in Microbiology* 9, doi:10.3389/fmicb.2018.01515 (2018).
- 20 Li, X. *et al.* Novel approach for removing brominated flame retardant from aquatic environments using Cu/Fe-based metal-organic frameworks: A case of

- hexabromocyclododecane (HBCD). *Science of The Total Environment* 621, 1533-1541, doi:<https://doi.org/10.1016/j.scitotenv.2017.10.075> (2018).
- 21 Yan, X. *et al.* Disposal of hexabromocyclododecane (HBCD) by grinding assisted with sodium persulfate. *RSC Advances* 7, 23313-23318, doi:10.1039/c7ra02689g (2017).
- 22 Rajbanshi, B. *et al.* Study to Probe Subsistence of Host-Guest Inclusion Complexes of α and β -Cyclodextrins with Biologically Potent Drugs for Safety Regulatory Discharge. *Scientific Reports* 8, 13031, doi:10.1038/s41598-018-31373-x (2018).
- 23 Saha, S., Roy, A. & Roy, M. N. Mechanistic Investigation of Inclusion Complexes of a Sulfa Drug with α - and β -Cyclodextrins. *Industrial & Engineering Chemistry Research* 56, 11672-11683, doi:10.1021/acs.iecr.7b02619 (2017).
- 24 Zhou, H., Yamada, T. & Kimizuka, N. Supramolecular Thermo-Electrochemical Cells: Enhanced Thermoelectric Performance by Host-Guest Complexation and Salt-Induced Crystallization. *Journal of the American Chemical Society* 138, 10502-10507, doi:10.1021/jacs.6b04923 (2016).
- 25 Xue, M., Wei, W., Su, Y., Johnson, D. & Heath, J. R. Supramolecular Probes for Assessing Glutamine Uptake Enable Semi-Quantitative Metabolic Models in Single Cells. *Journal of the American Chemical Society* 138, 3085-3093, doi:10.1021/jacs.5b12187 (2016).
- 26 Ling, B. *et al.* Mechanism study on pH-responsive cyclodextrin capped mesoporous silica: effect of different stalk densities and the type of cyclodextrin. *Nanotechnology* 26, 165704 (2015).
- 27 Rajesh, K. G., Suzuki, R., Maeda, H., Murio, Y. & Sasaguri, S. 5-HT₂ receptor blocker sarpogrelate prevents downregulation of antiapoptotic protein Bcl-2 and protects the heart against ischemia-reperfusion injury. *Life Sci* 79, 1749-1755, doi:10.1016/j.lfs.2006.06.026 (2006).

- 28 Li, H. *et al.* Viologen-mediated assembly of and sensing with carboxylatopillar[5]arene-modified gold nanoparticles. *J Am Chem Soc* 135, 1570-1576 (2013).
- 29 Saha, S., Roy, A., Roy, K. & Roy, M. N. Study to explore the mechanism to form inclusion complexes of β -cyclodextrin with vitamin molecules. *Scientific Reports* 6, 35764, doi:10.1038/srep35764
<https://www.nature.com/articles/srep35764#supplementary-information> (2016).
- 30 Roy, M. N., Roy, A. & Saha, S. Probing inclusion complexes of cyclodextrins with amino acids by physicochemical approach. *Carbohydrate Polymers* 151, 458-466, doi:10.1016/j.carbpol.2016.05.100 (2016).
- 31 Roy, M. N., Saha, S., Barman, S. & Ekka, D. Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods. *RSC Advances* 6, 8881-8891, doi:10.1039/c5ra24102b (2016).
- 32 Ji, H., Liu, F. & Sun, S. Study of the Counter Anions in the Host-Guest Chemistry of Cucurbit[8]uril and 1-Ethyl-1'-benzyl-4,4'-bipyridinium. *The Scientific World Journal* 2013, 452056, doi:10.1155/2013/452056 (2013).
- 33 Yang, L. J. *et al.* Preparation and characterization of inclusion complexes of naringenin with beta-cyclodextrin or its derivative. *Carbohydr Polym* 98, 861-869 (2013).
- 34 Fernandes, A. *et al.* Structural characterization of inclusion complexes between cyanidin-3-O-glucoside and β -cyclodextrin. *Carbohydrate Polymers* 102, 269-277, doi:<https://doi.org/10.1016/j.carbpol.2013.11.037> (2014).
- 35 Yang, B., Lin, J., Chen, Y. & Liu, Y. Artemether/hydroxypropyl-beta-cyclodextrin host-guest system: characterization, phase-solubility and inclusion mode. *Bioorg Med Chem* 17, 6311-6317, doi:10.1016/j.bmc.2009.07.060 (2009).
- 36 Servais, A.-C. *et al.* Capillary electrophoretic and nuclear magnetic resonance studies on the opposite affinity pattern of propranolol enantiomers towards

- various cyclodextrins. *Journal of Separation Science* 33, 1617-1624, doi:10.1002/jssc.201000040 (2010).
- 37 Correia, I. *et al.* Study of inclusion complexes of acridine with β - and (2,6-di-O-methyl)- β -cyclodextrin by use of solubility diagrams and NMR spectroscopy. *Journal of Physical Organic Chemistry* 15, 647-659, doi:10.1002/poc.528 (2002).
- 38 Bednarek, E. *et al.* Complexation of steroid hormones: prednisolone, ethinyloestradiol and estriol with [small beta]-cyclodextrin. An aqueous ^1H NMR study. *Journal of the Chemical Society, Perkin Transactions 2*, 999-1004, doi:10.1039/b110435g (2002).
- 39 Ishizu, T., Hirata, C., Yamamoto, H. & Harano, K. Structure and intramolecular flexibility of β -cyclodextrin complex with (-)-epigallocatechin gallate in aqueous solvent. *Magnetic Resonance in Chemistry* 44, 776-783, doi:10.1002/mrc.1848 (2006).
- 40 Kemelbekov, U. *et al.* IR, UV and NMR studies of β -cyclodextrin inclusion complexes of kazcaine and prosidol bases. *Journal of inclusion phenomena and macrocyclic chemistry* 69, 181-190, doi:10.1007/s10847-010-9829-x (2011).
- 41 Stalin, T., Srinivasan, K., Sivakumar, K. & Radhakrishnan, S. Preparation and characterizations of solid/aqueous phases inclusion complex of 2,4-dinitroaniline with beta-cyclodextrin.
- 42 Sivakumar, K., Ragi, T. R., Prema, D. & Stalin, T. Experimental and theoretical investigation on the structural characterization and orientation preferences of 2-hydroxy-1-naphthoic acid/ β -cyclodextrin host-guest inclusion complex. *Journal of Molecular Liquids* 218, 538-548, doi:https://doi.org/10.1016/j.molliq.2016.03.004 (2016).
- 43 Negi, J. S. & Singh, S. Spectroscopic investigation on the inclusion complex formation between amisulpride and gamma-cyclodextrin. *Carbohydr Polym* 92, 1835-1843 (2013).

- 44 Xiao, C. F. *et al.* Investigation of inclusion complex of epothilone A with cyclodextrins.
- 45 Zhang, J. Q. *et al.* Novel water-soluble fisetin/cyclodextrins inclusion complexes: Preparation, characterization, molecular docking and bioavailability. *Carbohydr Res* 418, 20-28 (2015).
- 46 Okada, Y., Ueyama, K., Nishikawa, J.-i., Semma, M. & Ichikawa, A. *Effect of 6-O- α -maltosyl- β cyclodextrin and its cholesterol inclusion complex on cellular cholesterol levels and ABCA1 and ABCG1 expression in mouse mastocytoma P-815 cells.* Vol. 357 (2012).
- 47 Keutner, C. *et al.* Photoemission Electron Microscopy and Scanning Electron Microscopy of *Magnetospirillum magnetotacticum*'s Magnetosome Chains. *Analytical Chemistry* 86, 9590-9594, doi:10.1021/ac502050j (2014).
- 48 Tsiper, S. *et al.* Sparsity-Based Super Resolution for SEM Images. *Nano Letters* 17, 5437-5445, doi:10.1021/acs.nanolett.7b02091 (2017).
- 49 Piispanen, M. H. *et al.* A Comparative Study of Fly ash Characterization by LA-ICP-MS and SEM-EDS. *Energy & Fuels* 23, 3451-3456, doi:10.1021/ef801037a (2009).
- 50 Sifaoui, H. *et al.* Formation of β -cyclodextrin complexes in an anhydrous environment. *Journal of Molecular Modeling* 22, 207, doi:10.1007/s00894-016-3061-6 (2016).
- 51 Celebioglu, A. & Uyar, T. Antioxidant Vitamin E/Cyclodextrin Inclusion Complex Electrospun Nanofibers: Enhanced Water Solubility, Prolonged Shelf Life, and Photostability of Vitamin E. *Journal of Agricultural and Food Chemistry* 65, 5404-5412, doi:10.1021/acs.jafc.7b01562 (2017).
- 52 Yang, G.-F., Wang, H.-B., Yang, W.-C., Gao, D. & Zhan, C.-G. Bioactive Permethrin/ β -Cyclodextrin Inclusion Complex. *The Journal of Physical Chemistry B* 110, 7044-7048, doi:10.1021/jp056809l (2006).

- 53 Păduraru, O. M., Bosînceanu, A., Țântaru, G. & Vasile, C. Effect of Hydroxypropyl- β -Cyclodextrin on the Solubility of an Antiarrhythmic Agent. *Industrial & Engineering Chemistry Research* 52, 2174-2181, doi:10.1021/ie303440w (2013).
- 54 Takahama, Y. & Yamada, Y. Isolation of *Pseudomonas* sp. Strain HB01 Which Degrades the Persistent Brominated Flame Retardant γ -Hexabromocyclododecane AU - YAMADA, Takashi. *Bioscience, Biotechnology, and Biochemistry* 73, 1674-1678, doi:10.1271/bbb.90104 (2009).
- 55 Kamanavalli, C. M. & Ninnekar, H. Z. Biodegradation of DDT by a *Pseudomonas* Species. *Current Microbiology* 48, 10-13, doi:10.1007/s00284-003-4053-1 (2004).
- 56 Lin, Q. & Jianlong, W. Biodegradation characteristics of quinoline by *Pseudomonas putida*. *Bioresour Technol* 101, 7683-7686, doi:10.1016/j.biortech.2010.05.026 (2010).

CHAPTER VII

- 1 Annahazi, A., Roka, R., Rosztoczy, A. & Wittmann, T. Role of antispasmodics in the treatment of irritable bowel syndrome. *World J Gastroenterol* 20, 6031-6043 (2014).
- 2 Martinez-Vazquez, M. A. *et al.* Effect of antispasmodic agents, alone or in combination, in the treatment of Irritable Bowel Syndrome: systematic review and meta-analysis. *Rev Gastroenterol Mex* 77, 82-90 (2012).
- 3 Carmona-Sánchez, R. *et al.* Consenso mexicano sobre el síndrome de intestino irritable. *Revista de Gastroenterología de México* 81, 149-167, doi:https://doi.org/10.1016/j.rgmx.2016.01.004 (2016).
- 4 Remes-Troche, J. M. *et al.* Guía clínica para diagnóstico y tratamiento de la enfermedad celíaca en México. *Revista de Gastroenterología de México* 83, 434-450, doi:https://doi.org/10.1016/j.rgmx.2018.05.005 (2018).

- 5 Wittmann, T., Paradowski, L., Ducrotte, P., Bueno, L. & Andro Delestrain, M. C. Clinical trial: the efficacy of alverine citrate/simeticone combination on abdominal pain/discomfort in irritable bowel syndrome--a randomized, double-blind, placebo-controlled study. *Aliment Pharmacol Ther* 31, 615-624 (2010).
- 6 Catterall, W. A. Voltage-gated calcium channels. *Cold Spring Harbor perspectives in biology* 3, a003947-a003947, doi:10.1101/cshperspect.a003947.
- 7 Wu, J. *et al.* Structure of the voltage-gated calcium channel Cav1.1 at 3.6 Å resolution. *Nature* 537, 191, doi:10.1038/nature19321
<https://www.nature.com/articles/nature19321#supplementary-information> (2016).
- 8 Catterall, W. A. & Zheng, N. Deciphering voltage-gated Na⁺ and Ca²⁺ channels by studying prokaryotic ancestors. *Trends in Biochemical Sciences* 40, 526-534, doi:10.1016/j.tibs.2015.07.002 (2015).
- 9 Rathod, D. M. *et al.* An improved LC-MS/MS method for the quantification of alverine and para hydroxy alverine in human plasma for a bioequivalence study(☆). *Journal of pharmaceutical analysis* 7, 95-102, doi:10.1016/j.jpha.2016.11.003 (2017).
- 10 Flarakos, J., Morand, K. L. & Vouros, P. High-Throughput Solution-Based Medicinal Library Screening against Human Serum Albumin. *Analytical Chemistry* 77, 1345-1353, doi:10.1021/ac048685z (2005).
- 11 Vuignier, K., Veuthey, J. L., Carrupt, P. A. & Schappler, J. Global analytical strategy to measure drug-plasma protein interactions: from high-throughput to in-depth analysis. *Drug Discov Today* 18, 1030-1034 (2013).
- 12 Zsila, F. Subdomain IB Is the Third Major Drug Binding Region of Human Serum Albumin: Toward the Three-Sites Model. *Molecular Pharmaceutics* 10, 1668-1682, doi:10.1021/mp400027q (2013).
- 13 Dalvit, C., Fagerness, P. E., Hadden, D. T., Sarver, R. W. & Stockman, B. J. Fluorine-NMR experiments for high-throughput screening: theoretical aspects, practical

- considerations, and range of applicability. *J Am Chem Soc* 125, 7696-7703 (2003).
- 14 Job, P. *Formation and stability of inorganic complexes in solution*. Vol. 10 (1928).
- 15 Kano, K., Nishiyabu, R., Asada, T. & Kuroda, Y. Static and Dynamic Behavior of 2:1 Inclusion Complexes of Cyclodextrins and Charged Porphyrins in Aqueous Organic Media. *Journal of the American Chemical Society* 124, 9937-9944, doi:10.1021/ja020253n (2002).
- 16 Renny, J. S., Tomasevich, L. L., Tallmadge, E. H. & Collum, D. B. Method of continuous variations: applications of job plots to the study of molecular associations in organometallic chemistry. *Angew Chem Int Ed Engl* 52, 11998-12013 (2013).
- 17 He, J., Deng, L. & Yang, S. Synthesis and characterization of beta-cyclodextrin inclusion complex containing di(8-hydroxyquinoline) magnesium. *Spectrochim Acta A Mol Biomol Spectrosc* 70, 878-883, doi:10.1016/j.saa.2007.10.004 (2008).
- 18 Liu, Y., Yang, Y.-W., Chen, Y. & Ding, F. Efficient fluorescent sensors of oligopeptides by dithiobis(2-benzoylamide)-bridged bis(beta-cyclodextrin)s: structure in solution, binding behavior, and thermodynamic origin. *Bioorg Med Chem* 13, 963-971, doi:10.1016/j.bmc.2004.11.042 (2005).
- 19 Zhang, J. Q. *et al.* Novel water-soluble fisetin/cyclodextrins inclusion complexes: Preparation, characterization, molecular docking and bioavailability. *Carbohydr Res* 418, 20-28 (2015).
- 20 Okada, Y., Ueyama, K., Nishikawa, J.-i., Semma, M. & Ichikawa, A. *Effect of 6-O- α -maltosyl- β cyclodextrin and its cholesterol inclusion complex on cellular cholesterol levels and ABCA1 and ABCG1 expression in mouse mastocytoma P-815 cells*. Vol. 357 (2012).
- 21 Sindelar, V. *et al.* Supramolecular assembly of 2,7-dimethyldiazapyrenium and cucurbit[8]uril: a new fluorescent host for detection of catechol and dopamine.

- 22 Yang, L. J. *et al.* Preparation and characterization of inclusion complexes of naringenin with beta-cyclodextrin or its derivative. *Carbohydr Polym* 98, 861-869 (2013).
- 23 Fernandes, A. *et al.* Structural characterization of inclusion complexes between cyanidin-3-O-glucoside and β -cyclodextrin. *Carbohydrate Polymers* 102, 269-277, doi:<https://doi.org/10.1016/j.carbpol.2013.11.037> (2014).
- 24 Xiao, C. F. *et al.* Investigation of inclusion complex of epothilone A with cyclodextrins.
- 25 Yang, B., Lin, J., Chen, Y. & Liu, Y. Artemether/hydroxypropyl-beta-cyclodextrin host-guest system: characterization, phase-solubility and inclusion mode. *Bioorg Med Chem* 17, 6311-6317, doi:10.1016/j.bmc.2009.07.060 (2009).
- 26 Servais, A. C. *et al.* Capillary electrophoretic and nuclear magnetic resonance studies on the opposite affinity pattern of propranolol enantiomers towards various cyclodextrins.
- 27 Correia, I. *et al.* Study of inclusion complexes of acridine with β - and (2,6-di-O-methyl)- β -cyclodextrin by use of solubility diagrams and NMR spectroscopy. *Journal of Physical Organic Chemistry* 15, 647-659, doi:10.1002/poc.528 (2002).
- 28 Kemelbekov, U. *et al.* IR, UV and NMR studies of β -cyclodextrin inclusion complexes of kazcaine and prosidol bases. *Journal of inclusion phenomena and macrocyclic chemistry* 69, 181-190, doi:10.1007/s10847-010-9829-x (2011).
- 29 Stalin, T., Srinivasan, K., Sivakumar, K. & Radhakrishnan, S. Preparation and characterizations of solid/aqueous phases inclusion complex of 2,4-dinitroaniline with beta-cyclodextrin.
- 30 Sivakumar, K., Ragi, T. R., Prema, D. & Stalin, T. Experimental and theoretical investigation on the structural characterization and orientation preferences of 2-hydroxy-1-naphthoic acid/ β -cyclodextrin host-guest inclusion complex. *Journal of Molecular Liquids* 218, 538-548, doi:<https://doi.org/10.1016/j.molliq.2016.03.004> (2016).

- 31 Negi, J. S. & Singh, S. Spectroscopic investigation on the inclusion complex formation between amisulpride and gamma-cyclodextrin. *Carbohydr Polym* 92, 1835-1843 (2013).
- 32 Inoue, Y., Hirano, A., Murata, I., Kobata, K. & Kanamoto, I. *Assessment of the Physical Properties of Inclusion Complexes of Forchlorfenuron and γ -Cyclodextrin Derivatives and Their Promotion of Plant Growth*. Vol. 3 (2018).
- 33 Suzuki, R. *et al.* Preparation, characterization, and study of the antimicrobial activity of a Hinokitiol-copper(II)/ γ -cyclodextrin ternary complex. *Journal of Molecular Structure* 1194, 19-27, doi:<https://doi.org/10.1016/j.molstruc.2019.05.078> (2019).
- 34 Tanwar, S., Barbey, C. & Dupont, N. Experimental and theoretical studies of the inclusion complex of different linear aliphatic alcohols with cyclodextrins. *Carbohydrate Polymers* 217, 26-34, doi:<https://doi.org/10.1016/j.carbpol.2019.04.052> (2019).
- 35 Yadav, V. R., Suresh, S., Devi, K. & Yadav, S. Effect of cyclodextrin complexation of curcumin on its solubility and antiangiogenic and anti-inflammatory activity in rat colitis model. *AAPS PharmSciTech* 10, 752-762 (2009).
- 36 Yao, Q. *et al.* Inclusion complexes of cypermethrin and permethrin with monochlorotriazinyl-beta-cyclodextrin: a combined spectroscopy, TG/DSC and DFT study. *Spectrochim Acta A Mol Biomol Spectrosc* 117, 576-586 (2014).
- 37 Li, J.-H., Zhang, N., Li, X.-T. & Wang, J.-Y. Thermal Stability and Decomposition Kinetics of the β -CD Cinnamic Aldehyde Inclusion Complex. *Journal of inclusion phenomena and molecular recognition in chemistry* 28, 95-103, doi:[10.1023/a:1007991708832](https://doi.org/10.1023/a:1007991708832) (1997).
- 38 Jiang, L., Yang, J., Wang, Q., Ren, L. & Zhou, J. Physicochemical properties of catechin/ β -cyclodextrin inclusion complex obtained via co-precipitation. *CyTA - Journal of Food* 17, 544-551, doi:[10.1080/19476337.2019.1612948](https://doi.org/10.1080/19476337.2019.1612948) (2019).

- 39 Yildiz, Z. I. & Uyar, T. Fast-dissolving electrospun nanofibrous films of paracetamol/cyclodextrin inclusion complexes. *Applied Surface Science* 492, 626-633, doi:<https://doi.org/10.1016/j.apsusc.2019.06.220> (2019).
- 40 Qiu, N. *et al.* Inclusion complex of emodin with hydroxypropyl- β -cyclodextrin: Preparation, physicochemical and biological properties. *Journal of Molecular Liquids* 289, 111151, doi:<https://doi.org/10.1016/j.molliq.2019.111151> (2019).
- 41 Rajbanshi, B. *et al.* Study to Probe Subsistence of Host-Guest Inclusion Complexes of α and β -Cyclodextrins with Biologically Potent Drugs for Safety Regulatory Discharge. *Scientific Reports* 8, 13031, doi:10.1038/s41598-018-31373-x (2018).
- 42 Matencio, A., Hernández-García, S., García-Carmona, F. & López-Nicolás, M. J. A Way to Increase the Bioaccessibility and Photostability of Roflumilast, a COPD Treatment, by Cyclodextrin Monomers. *Polymers* 11, doi:10.3390/polym11050801 (2019).
- 43 Sursyakova, V. V., Levdansky, V. A. & Rubaylo, A. I. Thermodynamic parameters for the complexation of water-insoluble betulin derivatives with (2-hydroxypropyl)- γ -cyclodextrin determined by phase-solubility technique combined with capillary zone electrophoresis. *ELECTROPHORESIS* 40, 1656-1661, doi:10.1002/elps.201800516 (2019).
- 44 Loftsson, T., Hreinsdottir, D. & Masson, M. Evaluation of cyclodextrin solubilization of drugs. *Int J Pharm* 302, 18-28 (2005).
- 45 Benesi, H. A. & Hildebrand, J. H. A Spectrophotometric Investigation of the Interaction of Iodine with Aromatic Hydrocarbons. *Journal of the American Chemical Society* 71, 2703-2707, doi:10.1021/ja01176a030 (1949).
- 46 Das, K. *et al.* Physicochemical investigations of amino acid ionic liquid based inclusion complex probed by spectral and molecular docking techniques. *Journal of Molecular Liquids* 291, 111255, doi:<https://doi.org/10.1016/j.molliq.2019.111255> (2019).

- 47 Saha, S., Roy, A., Roy, K. & Roy, M. N. Study to explore the mechanism to form inclusion complexes of β -cyclodextrin with vitamin molecules. *Scientific Reports* 6, 35764, doi:10.1038/srep35764
<https://www.nature.com/articles/srep35764#supplementary-information> (2016).
- 48 Roy, P. M., Saha, S., Barman, S. & Ekka, D. D. *Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods*. Vol. 6 (2016).
- 49 Cramer, F., Saenger, W. & Spatz, H. C. Inclusion Compounds. XIX.1a The Formation of Inclusion Compounds of α -Cyclodextrin in Aqueous Solutions. Thermodynamics and Kinetics. *Journal of the American Chemical Society* 89, 14-20, doi:10.1021/ja00977a003 (1967).
- 50 Roy, M. N., Saha, S., Barman, S. & Ekka, D. Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods. *RSC Advances* 6, 8881-8891, doi:10.1039/c5ra24102b (2016).
- 51 Caso, J. V. *et al.* Investigating the inclusion properties of aromatic amino acids complexing beta-cyclodextrins in model peptides. *Amino Acids* 47, 2215-2227 (2015).
- 52 Huang, B. *et al.* A low temperature and highly sensitive ethanol sensor based on Au modified In₂O₃ nanofibers by coaxial electrospinning. *Journal of Materials Chemistry C* 6, 10935-10943, doi:10.1039/c8tc03669a (2018).
- 53 Yeggoni, D. P., Rachamalla, A., Dubey, S., Mitra, A. & Subramanyam, R. Probing the interaction mechanism of menthol with blood plasma proteins and its cytotoxicity activities. *J Biomol Struct Dyn* 36, 465-474 (2018).
- 54 Jia, K. *et al.* Plasmon enhanced fluorescence of a bisphthalonitrile-based dye via a dopamine mediated interfacial crosslinking reaction on silver nanoparticles. *RSC Advances* 5, 71652-71657, doi:10.1039/c5ra12242b (2015).

CHAPTER VIII

- 1 Voigt, J. J. M. Jones: Food Safety. 453 Seiten, zahlr. Abb. und Tab. Eagan Press, St. Paul, Minnesota, 1992. Preis: 50,- \$ (USA 42,- \$). *Food / Nahrung* 36, 425-425, doi:10.1002/food.19920360440 (1992).
- 2 4: Final Report on the Safety Assessment of Sorbic Acid and Potassium Sorbate. *Journal of the American College of Toxicology* 7, 837-880, doi:10.3109/10915818809078711 (1988).
- 3 Puttemans, M. L., Branders, C., Dryon, L. & Massart, D. L. Extraction of organic acids by ion-pair formation with tri-n-octylamine. Part 6. Determination of sorbic acid, benzoic acid, and saccharin in yogurt. *J Assoc Off Anal Chem* 68, 80-82 (1985).
- 4 M, P. J. H. & T, G. M. Rapid high-performance liquid chromatography method for the analysis of sodium benzoate and potassium sorbate in foods. *Journal of chromatography. A : including electrophoresis and other separation methods* 883, 299-304 (2000).
- 5 Kubota, K. & Ishizaki, T. Dose-dependent pharmacokinetics of benzoic acid following oral administration of sodium benzoate to humans. *Eur J Clin Pharmacol* 41, 363-368 (1991).
- 6 Praphanphoj, V., Boyadjiev, S. A., Waber, L. J., Brusilow, S. W. & Geraghty, M. T. Three cases of intravenous sodium benzoate and sodium phenylacetate toxicity occurring in the treatment of acute hyperammonaemia. *J Inherit Metab Dis* 23, 129-136 (2000).
- 7 Wittke, P. & Walther, F. Cyclic Deformation Behavior of Friction Drilled Internal Threads in AlSi10Mg and AZ31 Profiles. *Procedia Structural Integrity* 2, 3264-3271, doi:<https://doi.org/10.1016/j.prostr.2016.06.407> (2016).
- 8 Moses, J., Siddiqui, A. & Silverman, P. B. Sodium benzoate differentially blocks circling induced by D-and L-dopa in the hemi-parkinsonian rat. *Neurosci Lett* 218, 145-148, doi:10.1016/s0304-3940(96)13131-1 (1996).

- 9 Zengin, N., Yuzbasioglu, D., Unal, F., Yilmaz, S. & Aksoy, H. The evaluation of the genotoxicity of two food preservatives: sodium benzoate and potassium benzoate. *Food Chem Toxicol* 49, 763-769 (2011).
- 10 Lennerz, B. S. *et al.* Effects of sodium benzoate, a widely used food preservative, on glucose homeostasis and metabolic profiles in humans. *Mol Genet Metab* 114, 73-79 (2015).
- 11 Liu, D. *et al.* Microfibrillar Polysaccharide-Derived Biochars as Sodium Benzoate Adsorbents. *ACS Omega* 2, 2959-2966, doi:10.1021/acsomega.7b00404 (2017).
- 12 López-Malo, A., Barreto-Valdivieso, J., Palou, E. & Martín, F. S. *Aspergillus flavus* growth response to cinnamon extract and sodium benzoate mixtures. *Food Control* 18, 1358-1362, doi:https://doi.org/10.1016/j.foodcont.2006.04.010 (2007).
- 13 Sagoo, S. K., Board, R. & Roller, S. Chitosan potentiates the antimicrobial action of sodium benzoate on spoilage yeasts. *Lett Appl Microbiol* 34, 168-172 (2002).
- 14 Farber, B. F. & Wolff, A. G. The use of nonsteroidal antiinflammatory drugs to prevent adherence of *Staphylococcus epidermidis* to medical polymers. *J Infect Dis* 166, 861-865 (1992).
- 15 Muller, E., Al-Attar, J., Wolff, A. G. & Farber, B. F. Mechanism of salicylate-mediated inhibition of biofilm in *Staphylococcus epidermidis*. *J Infect Dis* 177, 501-503 (1998).
- 16 Domenico, P., Straus, D. C., Woods, D. E. & Cunha, B. A. Salicylate Potentiates Amikacin Therapy in Rodent Models of *Klebsiella Pneumoniae* Infection. *The Journal of Infectious Diseases* 168, 766-769 (1993).
- 17 Polonio, R. E., Mermel, L. A., Paquette, G. E. & Sperry, J. F. Eradication of Biofilm-Forming *Staphylococcus epidermidis* (RP62A) by a Combination of Sodium Salicylate and Vancomycin. *Antimicrobial Agents and Chemotherapy* 45, 3262 (2001).

- 18 Manhart, M. D. In vitro antimicrobial activity of bismuth subsalicylate and other bismuth salts. *Rev Infect Dis* 12, S11-15 (1990).
- 19 Vane, S. J. Aspirin and other anti-inflammatory drugs. *Thorax* 55, S3-S9, doi:10.1136/thorax.55.suppl_2.S3 (2000).
- 20 Awtry, E. H. & Loscalzo, J. Aspirin. *Circulation* 101, 1206-1218 (2000).
- 21 Domenico, P., Hopkins, T. & Cunha, B. A. The effect of sodium salicylate on antibiotic susceptibility and synergy in *Klebsiella pneumoniae*. *Journal of Antimicrobial Chemotherapy* 26, 343-351, doi:10.1093/jac/26.3.343 (1990).
- 22 Friberg, S. E. Interactions of Surfactants with Polymers and Proteins. E.D.Goddard and K.P. Ananthapadmanabhan (eds.), CRC Press, Boca Raton, FL, 1993, pp. 1-427, \$169.95. *Journal of Dispersion Science and Technology* 15, 399-399, doi:10.1080/01932699408943565 (1994).
- 23 Balouiri, M., Sadiki, M. & Ibnsouda, S. K. Methods for in vitro evaluating antimicrobial activity: A review. *J Pharm Anal* 6, 71-79 (2016).
- 24 Lind, J. E., Zwolenik, J. J. & Fuoss, R. M. Calibration of Conductance Cells at 25° with Aqueous Solutions of Potassium Chloride¹. *Journal of the American Chemical Society* 81, 1557-1559, doi:10.1021/ja01516a010 (1959).
- 25 Masson, D. O. XXVIII. Solute molecular volumes in relation to solvation and ionization. *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science* 8, 218-235, doi:10.1080/14786440808564880 (1929).
- 26 Benz, R. & Bauer, K. Permeation of hydrophilic molecules through the outer membrane of gram-negative bacteria. Review on bacterial porins. *Eur J Biochem* 176, 1-19 (1988).
- 27 Sarkhel, S. & Desiraju, G. R. N-H...O, O-H...O, and C-H...O hydrogen bonds in protein-ligand complexes: strong and weak interactions in molecular recognition. *Proteins* 54, 247-259 (2004).

- 28 Roy, M. N., Chanda, R., Das, R. K. & Ekka, D. Densities and Viscosities of Citric Acid in Aqueous Cetrimonium Bromide Solutions with Reference to the Manifestation of Solvation. *Journal of Chemical & Engineering Data* 56, 3285-3290, doi:10.1021/je2000217 (2011).
- 29 Ayranci, E. Apparent Molar Volume and Viscosity of Compounds with Asymmetric Carbon Atoms. *Journal of Chemical & Engineering Data* 42, 934-937, doi:10.1021/je970055p (1997).
- 30 Yan, Z., Wang, J. & Lu, J. Apparent Molar Volumes and Viscosities of Some α -Amino Acids in Aqueous Sodium Butyrate Solutions at 298.15 K. *Journal of Chemical & Engineering Data* 46, 217-222, doi:10.1021/je000211j (2001).
- 31 Li, Y., Wang, X. & Wang, Y. Comparative Studies on Interactions of Bovine Serum Albumin with Cationic Gemini and Single-Chain Surfactants. *The Journal of Physical Chemistry B* 110, 8499-8505, doi:10.1021/jp060532n (2006).
- 32 Zafarani-Moattar, M. T., Shekaari, H. & Jafari, P. Thermodynamic study of aqueous two-phase systems containing biocompatible cholinium aminoate ionic-liquids and polyethylene glycol di-methyl ether 250 and their performances for bovine serum albumin separation. *The Journal of Chemical Thermodynamics* 130, 17-32, doi:https://doi.org/10.1016/j.jct.2018.10.001 (2019).
- 33 Kumar, K. & Chauhan, S. Surface tension and UV-visible investigations of aggregation and adsorption behavior of NaC and NaDC in water-amino acid mixtures. *Fluid Phase Equilibria* 394, 165-174, doi:https://doi.org/10.1016/j.fluid.2015.03.012 (2015).
- 34 Ravichandran, G., Lakshiminarayanan, G. & Ragouramane, D. Apparent molar volume and ultrasonic studies on some bile salts in water-aprotic solvent mixtures. *Fluid Phase Equilibria* 356, 256-263, doi:https://doi.org/10.1016/j.fluid.2013.07.041 (2013).
- 35 Ekka, D. & Roy, M. N. Molecular interactions of alpha-amino acids insight into aqueous beta-cyclodextrin systems. *Amino Acids* 45, 755-777 (2013).

- 36 Roy, M. N., Dakua, V. K. & Sinha, B. Partial Molar Volumes, Viscosity B-Coefficients, and Adiabatic Compressibilities of Sodium Molybdate in Aqueous 1,3-Dioxolane Mixtures from 303.15 to 323.15 K. *International Journal of Thermophysics* 28, 1275-1284, doi:10.1007/s10765-007-0220-0 (2007).
- 37 Zhang, Y. & Cremer, P. S. Interactions between macromolecules and ions: The Hofmeister series. *Curr Opin Chem Biol* 10, 658-663 (2006).
- 38 Yasmin, A., Barman, S., Barman, B. K. & Roy, M. N. Investigation of diverse interactions of amino acids (Asp and Glu) in aqueous Dopamine hydrochloride with the manifestation of the catecholamine molecule recognition tool in solution phase. *Journal of Molecular Liquids* 271, 715-729, doi:https://doi.org/10.1016/j.molliq.2018.08.114 (2018).
- 39 Tasic, A. Z., Djordjevic, B. D., Grozdanic, D. K. & Radojkovic, N. Use of mixing rules in predicting refractive indexes and specific refractivities for some binary liquid mixtures. *Journal of Chemical & Engineering Data* 37, 310-313, doi:10.1021/je00007a009 (1992).
- 40 The Chemistry of Macrocyclic Ligand Complexes L. F. Lindoy Cambridge: Cambridge University Press 1989, pp viii +269 £45.00. SUS 69.50 ISBN 0 521 25261 X. *Journal of Coordination Chemistry* 21, 87-87, doi:10.1080/00958979009408188 (1990).
- 41 Eisenberg, H. Chemical physics of ionic solutions. B. E. Conway and R. G. Barradas, Eds., Wiley, New York, 1966. 622 pp. \$25.00. *Journal of Polymer Science Part A-2: Polymer Physics* 6, 1943-1943, doi:10.1002/pol.1968.160061111 (1968).
- 42 Banipal, P. K., Banipal, T. S., Ahluwalia, J. C. & Lark, B. S. Partial molar heat capacities and volumes of transfer of some saccharides from water to aqueous urea solutions at T= 298.15 K. *The Journal of Chemical Thermodynamics* 32, 1409-1432, doi:https://doi.org/10.1006/jcht.2000.0689 (2000).
- 43 Jenkins, H. D. B. & Marcus, Y. Viscosity B-Coefficients of Ions in Solution. *Chemical Reviews* 95, 2695-2724, doi:10.1021/cr00040a004 (1995).

- 44 Briscoe, H. T. & Rinehart, W. T. Studies of Relative Viscosity of Non-aqueous Solutions. *The Journal of Physical Chemistry* 46, 387-394, doi:10.1021/j150417a009 (1942).
- 45 Brady, G. W. & Krause, J. T. Structure in Ionic Solutions. I. *The Journal of Chemical Physics* 27, 304-308, doi:10.1063/1.1743691 (1957).
- 46 Jones, G. & Dole, M. THE VISCOSITY OF AQUEOUS SOLUTIONS OF STRONG ELECTROLYTES WITH SPECIAL REFERENCE TO BARIUM CHLORIDE. *Journal of the American Chemical Society* 51, 2950-2964, doi:10.1021/ja01385a012 (1929).
- 47 Ali, A., Hyder, S. & Akther, Y. *Viscometric studies of α -amino acid in aqueous NaCl and MgCl₂ at 303 K*. Vol. 79 (2005).
- 48 Marcus, Y. Viscosity B-coefficients, structural entropies and heat capacities, and the effects of ions on the structure of water. *Journal of Solution Chemistry* 23, 831-848, doi:10.1007/bf00972677 (1994).
- 49 Friedman, H. L. & Krishnan, C. V. in *Aqueous Solutions of Simple Electrolytes* (ed Felix Franks) 1-118 (Springer US, 1973).
- 50 Devine, W. & M. Lowe, B. *Viscosity B-coefficients at 15 and 25 °C for glycine, β -alanine, 4-amino-n-butyric acid, and 6-amino-n-hexanoic acid in aqueous solution*. (1971).
- 51 Sarma, T. S. & Ahluwalia, J. C. Experimental studies on the structures of aqueous solutions of hydrophobic solutes. *Chemical Society Reviews* 2, 203-232, doi:10.1039/cs9730200203 (1973).
- 52 Pitkänen, I., Suuronen, J. & Nurmi, J. Partial Molar Volume, Ionization, Viscosity and Structure of Glycine Betaine in Aqueous Solutions. *Journal of Solution Chemistry* 39, 1609-1626, doi:10.1007/s10953-010-9618-6 (2010).
- 53 Bhattacharyya, M. M. & Sengupta, M. Ion-Solvent Interaction of Amino Acids. The Role of the "Zwitterionic" and the "Ionic" Forms in the Modification of Water

- Structure over the Temperature Range 25–45 °C. *Bulletin of the Chemical Society of Japan* 61, 4107-4112, doi:10.1246/bcsj.61.4107 (1988).
- 54 Ekka, D. & Roy, M. N. Conductance, a Contrivance To Explore Ion Association and Solvation Behavior of an Ionic Liquid (Tetrabutylphosphonium Tetrafluoroborate) in Acetonitrile, Tetrahydrofuran, 1,3-Dioxolane, and Their Binaries. *The Journal of Physical Chemistry B* 116, 11687-11694, doi:10.1021/jp302465s (2012).
- 55 Ekka, D., Ray, T., Roy, K. & Roy, M. N. Exploration of Solvation Consequence of Ionic Liquid [Bu₄PCH₃SO₃] in Various Solvent Systems by Conductance and FTIR Study. *Journal of Chemical & Engineering Data* 61, 2187-2196, doi:10.1021/acs.jced.5b00670 (2016).
- 56 Shen, X. M., Zhang, F. & Dryhurst, G. Oxidation of dopamine in the presence of cysteine: characterization of new toxic products. *Chem Res Toxicol* 10, 147-155 (1997).
- 57 Benesi, H. A. & Hildebrand, J. H. A Spectrophotometric Investigation of the Interaction of Iodine with Aromatic Hydrocarbons. *Journal of the American Chemical Society* 71, 2703-2707, doi:10.1021/ja01176a030 (1949).
- 58 Rajbanshi, B. *et al.* Study to Probe Subsistence of Host-Guest Inclusion Complexes of α and β -Cyclodextrins with Biologically Potent Drugs for Safety Regulatory Dischargement. *Scientific Reports* 8, 13031, doi:10.1038/s41598-018-31373-x (2018).
- 59 Roy, M. N., Saha, S., Barman, S. & Ekka, D. Host-guest inclusion complexes of RNA nucleosides inside aqueous cyclodextrins explored by physicochemical and spectroscopic methods. *RSC Advances* 6, 8881-8891, doi:10.1039/c5ra24102b (2016).
- 60 Caso, J. V. *et al.* Investigating the inclusion properties of aromatic amino acids complexing beta-cyclodextrins in model peptides. *Amino Acids* 47, 2215-2227 (2015).

- 61 Das, K., Roy, M. C., Rajbanshi, B. & Roy, M. N. Assorted interactions of amino acids prevailing in aqueous vitamin C solutions probed by physicochemical and ab-initio contrivances. *Chemical Physics Letters* 687, 209-221, doi:<https://doi.org/10.1016/j.cplett.2017.08.054> (2017).
- 62 Panigrahi, S. K. & Desiraju, G. R. Strong and weak hydrogen bonds in the protein-ligand interface. *Proteins* 67, 128-141 (2007).
- 63 Samadi, F., Eckelt, J., Wolf, B. A., Schüle, H. & Frey, H. Branched versus linear oligo(dimethylsiloxane): Differences in their thermodynamic interaction with solvents. *Journal of Polymer Science Part B: Polymer Physics* 48, 1309-1318, doi:10.1002/polb.22029 (2010).