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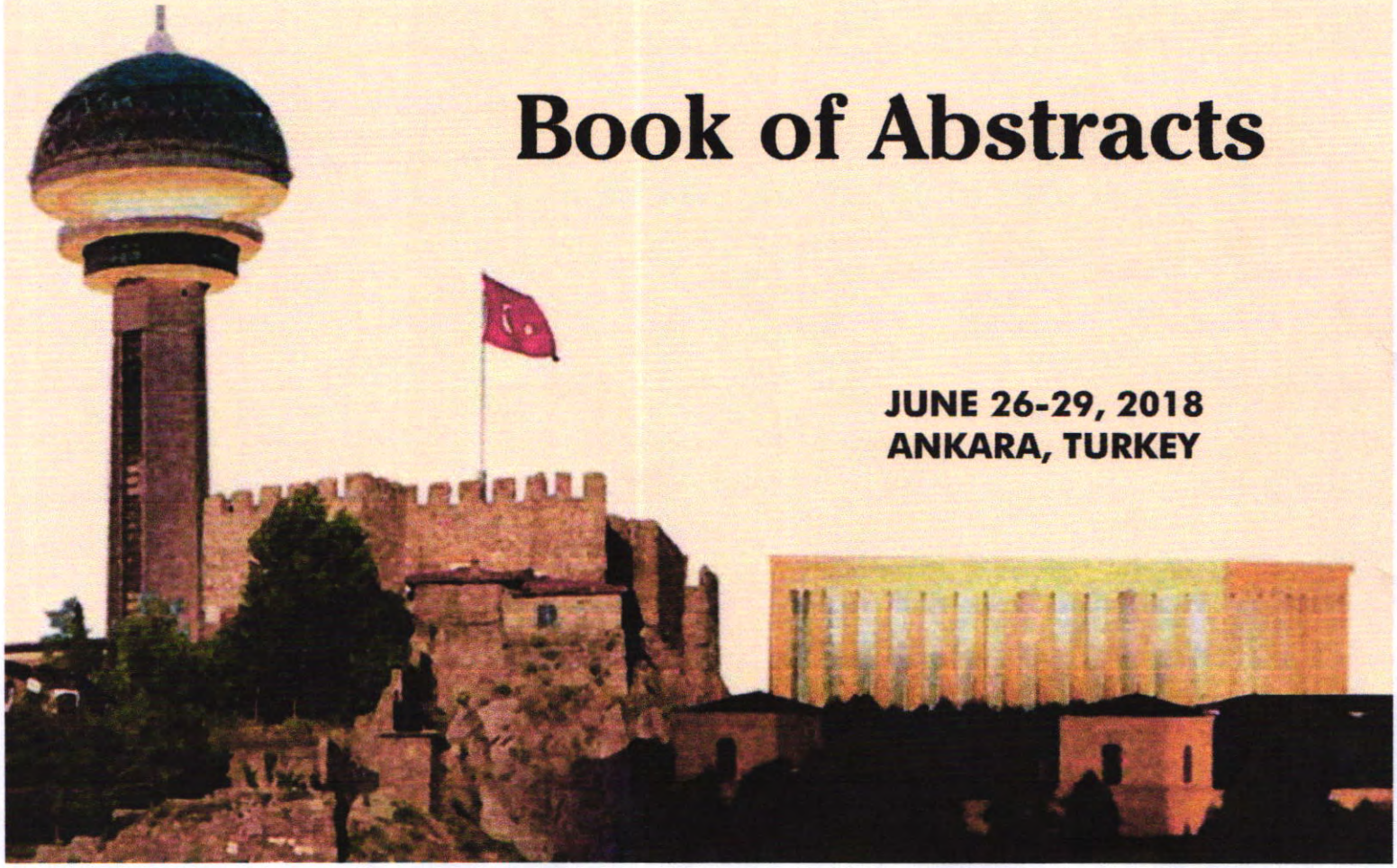
FACULTY OF PHARMACY

ISOPS 12th International SYMPOSIUM ON PHARMACEUTICAL SCIENCES

Book of Abstracts



JUNE 26-29, 2018
ANKARA, TURKEY

Ankara University Faculty of Pharmacy Publication No:121

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Dear Participants and Guests,

I would like to thank all the participants of 12th International Symposium on Pharmaceutical Sciences for their valuable contributions. You had spent your days in a charming country that shelters the oldest and the greatiest cultures and civilizations of the world.

The development of Symposiums on Pharmaceutical Sciences, which is held in our faculty, is getting more expanded through the 1989. This symposium was organized bianually until 1997 and then every three years. The previous 11 symposiums were held as;

1st International Symposium on Pharmaceutical Sciences	21-23 June 1989
2nd International Symposium on Pharmaceutical Sciences	11-14 June 1991
3rd International Symposium on Pharmaceutical Sciences	15-18 June 1993
4th International Symposium on Pharmaceutical Sciences	27-30 June 1995
5th International Symposium on Pharmaceutical Sciences	24-27 June 1997
6th International Symposium on Pharmaceutical Sciences	27-29 June 2000
7th International Symposium on Pharmaceutical Sciences	24-27 June 2003
8th International Symposium on Pharmaceutical Sciences	13-16 June 2006
9th International Symposium on Pharmaceutical Sciences	23-26 June 2009
10th International Symposium on Pharmaceutical Sciences	26-29 June 2012
11th International Symposium on Pharmaceutical Sciences	9-12 June 2015

The second institution in pharmacy education, Faculty of Pharmacy of Ankara University was founded in 1960 and started education in 1961-1962 semester. The length of pharmacy education had been 4 years until 2005 and increased to 5 years starting by that date. The new 5-year educational program has been updated according to the suggestions of the Advisory Committee on Pharmaceutical Training. This new program covers the basic courses such as mathematics, physics, chemistry as well as the basics in pharmacy education. Fifth year consists of some elective courses and the preparation of a graduation project. During the 5 years, students have to complete the 6-month training program mandatory in pharmacy/hospital or optionally in the industry. Our faculty has 6904 graduates since the established and the current number of students is 967.

Present educational and scientific resources allow a total of 138 faculty members, 49 professors, 13 associate professors, 16 assistant professors, 60 research assistants in our faculty. Moreover, 66 administrative staff members and other personnel are working at different offices.

The mission of 12th International Symposium of Pharmaceutical Sciences was to perform a broad scientific perspective by the invitation of distinguished scientists having national / international reputation in their areas, so most recent advances were discussed interactively and empower the knowledge-based drug research development and multidiciplinary collaborations. It was our intention to make this symposium a memorable event, both scientifically and socially for the attendees.

We are pleased to announce that around 800 scientists were registered to ISOPS-12 in which 664 oral/poster presentations participated as well as 41 distinguished lecturers invited from several countries.

In addition to general sessions and the posters, the exhibitors of some companies from drug industry that had introduced their equipments and products.

The topic of the Panel was "The road to the strong Turkish Pharmaceutical Industry". The lecturers were: Dr Hakkı Gürsöz, Prof.Dr.Nurten Özdemir, Ali Alkan, Turgut Tokgöz, Kemalettin Akalın, Ümit Dereli, Fatma Taman.

On the behalf of the Organizing Committee, I would like to mention my gratitude to the President of Ankara University who gave the whole support for the Symposium Organization. I would like to thank Turkish Ministry of Culture, Turkish Cooperation and coordination Agency, The Scientific and Technological Research Council of Turkey (TUBITAK), Turkish Pharmacist's Association and Pharmacist's Chamber of Ankara, Trabzon, İzmir, İstanbul and valuable represents of the pharmaceutical industry for their financial supports and pharmaceutical companies for their valuable sponsorship. I congratulate the organizing committee and all the other committees with all my heart and also all academic and managing personnel because of their extensive work. .

Prof. Dr. Gülbin ÖZÇELİKAY

Chair of ISOPS-12

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POSTER PRESENTATIONS

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Prof. Dr. Erkan İBİŞ

President of Ankara University

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Technische Universität Braunschweig

Institut für Medizinische und Pharmazeutische Chemie

Development of New Monolithic Polysaccharide-Based Columns for HPLC Enantiomeric Separation

Ratih; Asmari, M.; Eldeeb, S.
Institute of Medicinal and Pharmaceutical Chemistry | TU Braunschweig, D-38106 Braunschweig, Germany

Abstract

Chondroitin sulfate A and maltodextrin have been studied as potential chiral selectors to provide new polysaccharide-based chiral stationary phases. A capillary electrophoresis method has been involved to figure out the enantiomers recognition behaviour in the presence of chiral selector. Chondroitin sulfate A 0.3% w/v and maltodextrin 10% w/v which found to be the optimal values in CE were immobilized onto monolithic silica epoxy and monolithic silica amine columns by Schiff base reaction respectively. The immobilized chondroitin sulfate A-based and maltodextrin-based CSPs have shown initial enantiomeric separation of amlodipine and verapamil as model compounds of by HPLC.

Introduction

The planar polysaccharide, chondroitin sulfate A (CSA) and the maltodextrin (MD) which is a mixture of malto-oligo polysaccharide) have been studied as chiral selectors[1, 2]. Through a hydrolysis, MD is differentiated in various polymerization degrees as known as dextrose equivalent (DE) values[2]. CSA and MD have been previously reported as possible chiral selectors in capillary electrophoresis (CE) method[3, 4]. However, the enantiomeric separation using immobilized CSA and MD as chiral stationary phases (CSPs) in HPLC method has not been reported. Therefore, in this study, CSA and MD (DE 4-7) have been immobilized onto monolithic HPLC column and tested as new polysaccharide-based CSPs. Moreover, a CE method has been involved to figure out the enantiomeric recognition behaviour in the presence of chiral selector at certain concentrations.

Experimental

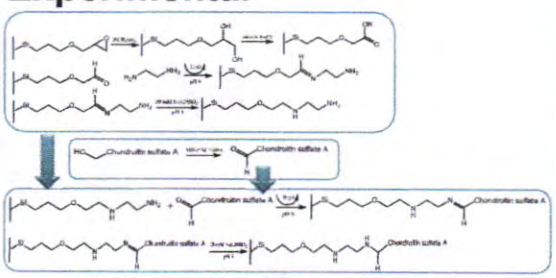

Fig 1. Immobilization scheme of CSA onto monolithic epoxy column.

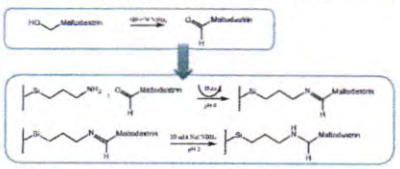

Fig 2. Immobilization scheme of MD onto monolithic amine column.

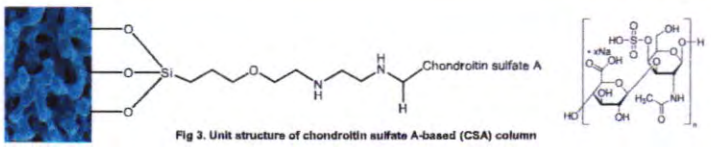

Fig 3. Unit structure of chondroitin sulfate A-based (CSA) column

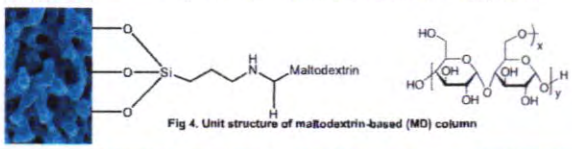

Fig 4. Unit structure of maltodextrin-based (MD) column

Table 1. CE conditions	
Capillary	Polymicro® Technologies; 50 µm ID; 45/36.5cm L_{tot}/L_{eff}
Temperature	25 °C
BGE	100 mM NaH_2PO_4, pH 3.0
Chiral selector	CSA 3.0% w/v; MD10 % w/v
Preconditioning	1 min: 0.1 M NaOH; 1 min: H_2O; 1 min: BGE
Injection	50 mbar, 6 s
Voltage	15 kV
Detection	UV 230 nm/240 nm

Table 2. HPLC conditions	
Mobile phase	50 mM Na_2HPO_4, pH 3.5
Stationary phase	CSA-based column and MD-based column
Organic modifier	Acetonitrile 25% v/v, 30% v/v
Flow rate	0.8 mL/min
Detection	UV 230 nm/240 nm

Results and Discussion

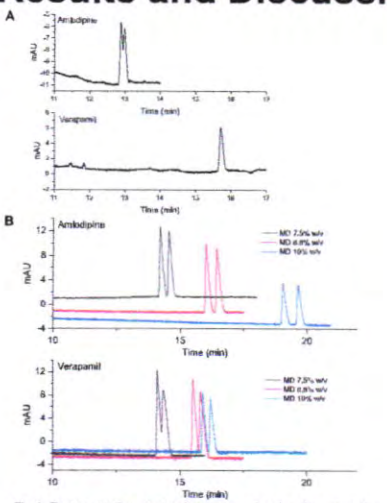

Fig 4. Representative electropherograms showing the separation of amlodipine and verapamil enantiomers in the presence of CSA (A) and MD (B) as chiral selectors.

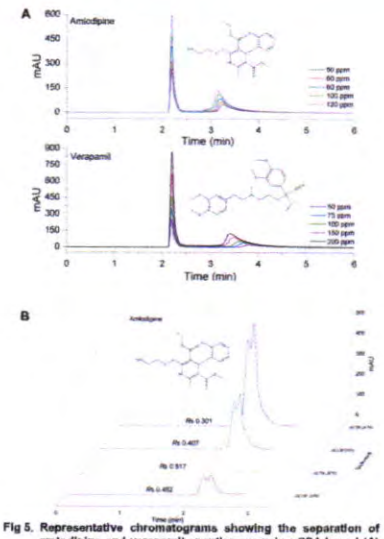

Fig 5. Representative chromatograms showing the separation of amlodipine and verapamil enantiomers using CSA-based (A) and MD-based (B) HPLC column.

Table 3. Resolution value				
Chiral Selector	CE		HPLC	
	AML	VER	AML	VER
CSA	Rs 0.810	ns	Rs 3.320	Rs 3.192
MD	Rs 2.345	Rs 1.410	Rs 0.517	ns

Chiral selector concentration plays an important role in the selectivity of enantiomeric separation by CE method. However, the nature of polysaccharides viscosity at the optimum concentration level have not feasible to be applied on HPLC system in directly. Due to the physicochemical characteristic of chiral selectors, several adjustment were needed during the immobilization and the evaluation of modified HPLC column.

Furthermore, the development of immobilized polysaccharide-based HPLC column becomes more challenging regarding to the chiral selector viscosity level and the number of functional groups attached onto silica surface. But, the enantiomeric selectivity is highly dependent on free functional group of chiral selector that might interact with target substance.

Conclusion

- CSA has been successfully immobilized onto monolithic silica HPLC column by Schiff base reaction. The immobilized HPLC column has been applied for enantiomeric separation with a good resolution.
- MD-based HPLC column has shown initial partial enantiomeric separation which could be further optimized.
- A computational modelling will be applied to investigate the chiral recognition mechanisms of CSA and MD as potential chiral selectors.

References

[1] Zhao L. *et al.*, (2016). J. Chromatogr. A, 1446:125-133.
[2] Nojavan S. *et al.*, (2014). Chirality, 26:394-399.
[3] Guiochon G. (2007). J. Chromatogr. A, 1168:101-168.
[4] Chankvetadze B. *et al.*, (2003). Chem. Lett., 32:850-851.

Acknowledgements

This study was supported by a research grant from Indonesia Endowment Fund for Education (LPDP), Ministry of Research, Technology - Directorate General of Higher Education (RISTEK DIKTI), Indonesia. The monolithic columns were kindly provided by Merck KGaA, Germany.

CONCLUSIONS:

When the results of the absorption spectra of carbidopa in the absence and presence of DNA are examined, it is understood that upon increasing the ratio of the concentration of DNA to drug, the absorption bands of carbidopa exhibited hypochromism, with red shifts.

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1. Shahabadi N, Kashanian S, Darabi F (2010). Europ. J. Med. Chem., 45(9):4239-4245.
2. Raman N, Sobha S, Mitu L (2013). J. Saudi Chem. Soc., 17(2):151-159.
3. Zhang G, Hu X, Pan J (2011). Spectrochimica Acta Part A, 78: 687-694.

P-251: ELECTROCHEMICAL INVESTIGATION OF DNA BINDING ON SULPIRIDE BY CYCLIC VOLTAMMETRY

Senel, P., Golcu, A.

Istanbul Technical University, Faculty of Arts and Sciences, Department of Chemistry, Istanbul, Turkey

INTRODUCTION:

Sulpiride is a substituted benzamide derivative drug and a selective dopamine D2 antagonist with antipsychotic and antidepressant activity. In contrast to most other neuroleptics which block both dopamine D1 and D2 receptors, Sulpiride is more selective and acts primarily as a dopamine D2 antagonist. It appears to lack effects on norepinephrine, acetylcholine, serotonin, histamine, or gamma-aminobutyric acid receptors (1).

MATERIALS AND METHODS:

The application of electrochemical methods to the study of organic and metallointeraction to DNA provides a useful complements to the previously used methods of investigation. Small molecules, which are not amenable to such methods or because of overlap of electronic transition with those of the DNA molecules, can be studied via voltammetric techniques. In addition, an electrochemical system can also serve as a versatile and illuminating model for gaining insight into the in vivo action in living cells (2).

RESULTS:

The electrochemical investigation of interaction of sulpiride with double strain DNA has been investigated by cyclic voltammetric studies on glassy carbon electrode at physiological pH and the binding constant (Kb) of drug to DNA was determined.

CONCLUSIONS:

Cyclic voltammetry based assay was developed for the assessment of the effect of the medium, substituents, potential scan rate and a number of scans on the voltammetric response of sulpiride-DNA couple.

REFERENCES:

1. https://www.drugbank.ca/
2. Ravikumar Naik TR, Bhojya Naik HS (2008). Int. J. Electrochem. Sci., 3:409-415.

P-253: DEVELOPMENT OF NEW MONOLITHIC POLYSACCHARIDE-BASED CHIRAL HPLC COLUMNS FOR ENANTIOMERIC SEPARATION

Ratih, Asmari, M., El Deeb, S.

Institute of Medicinal and Pharmaceutical Chemistry, TU Braunschweig, Germany

INTRODUCTION:

The planar polysaccharide, chondroitin sulfate A (CSA) and the maltodextrin (MD) which is a mixture of malto-oligo polysaccharide have been studied as potential chiral selectors. Through hydrolysis, MD is differentiated in various polymerization degrees known as dextrose equivalent (DE) values. CSA and MD have shown promising chiral recognition in capillary electrophoresis (CE). However, the enantiomeric separation using immobilized CSA and MD as chiral stationary phases (CSPs) in HPLC have not been reported. In this study, CSA and MD (DE 4-7) have been immobilized onto monolithic HPLC columns and tested as new polysaccharide-based CSPs. A CE method has been involved to figure out the enantiomeric recognition behaviour in the presence of chiral selector at certain concentrations.

MATERIALS AND METHODS:

Chromolith® Widepore 300 Epoxy 100-4.6 mm column and Chromolith® NH2 100-4.6 mm column were kindly provided by Merck KGaA Darmstadt, Germany. H_2SO_4, $NaIO_4$, $NaCNBH_3$, $NH_2CH_2CH_2NH_2$, Na_2HPO_4, CSA sodium salt (bovine trachea), MD (DE 4-7), (R, S)-amlodipine, and (R, S)-verapamil were acquired from Sigma-Aldrich (Steinheim, Germany). Acetonitrile (HPLC grade) were obtained from Merck (Darmstadt, Germany). Water was purified by Arium® Sartophore 0.2 µm, Sartorius (Gottingen, Germany).

CSA and MD were introduced by circulating them into monolithic epoxy and monolithic amine column under basic condition at a constant low flow rate, respectively. Afterward, the immobilization process was followed by a Schiff base reaction. The enantiomeric separations were performed using CE Agilent® and HPLC Hitachi®.

RESULTS:

The immobilized CSA-based and MD-based HPLC chiral columns have shown enantiomeric separations of amlodipine and verapamil as model compounds.

CONCLUSION:

The optimal concentrations of the chiral selectors which were obtained by CE method showed successful separations after immobilization on HPLC columns. Further studies will be conducted by experimental design for method optimization and by molecular modelling to investigate the possible interaction mechanisms between the two chiral selectors and target drugs.

ACKNOWLEDGEMENTS:

This study was supported by a research grant from Indonesia Endowment Fund for Education (LPDP), Ministry of Research, Technology-Directorate General of Higher Education (RISTEK DIKTI), Indonesia.

REFERENCES:

1. Zhao L et al., (2016). J. Chromatogr. A, 1446:125-133.
2. Nojavan S et al., (2014). Chirality, 26:394-399.
3. Guiochon G (2007). J. Chromatogr. A, 1168:101-168.
4. Chankvetadze B et al., (2003). Chem. Lett., 32:850–851.
5. Nishi H (1996). J. Chromatogr. A, 735:345-351.

P-254: DETERMINATION OF CIPROFLOXACIN IN AN OPHTHALMIC SOLUTION BY DERIVATIVE SPECTROPHOTOMETRIC METHOD

Dermis, S., Kilic, S., Ertekin, ZC., Dinc, E.

Ankara University, Faculty of Pharmacy, Department of Analytical Chemistry, Ankara, Turkey

INTRODUCTION:

Ciprofloxacin is an antiinfective agent which belongs to the class of fluoroquinolones. Beside its systemic use, it is also indicated for the bacterial eye infections (1). The purpose of this study was to develop and validate a first derivative spectrophotometric method and its application to the analysis of ciprofloxacin eye drops.

MATERIALS AND METHODS:

The absorbance spectra of calibration samples were recorded between 200-400 nm in the linear working range of 3.0-28.0 µg/mL. Zero order and first derivative spectra of the calibration set were given in Figure 1. The calibration equation was obtained using the derivative values at 283.2 nm. The method was validated by means of recovery, standard addition and repeatability studies. After validation studies, the proposed method was applied for the analysis of eye drop solution which contained 3.5 mg/mL ciprofloxacin.

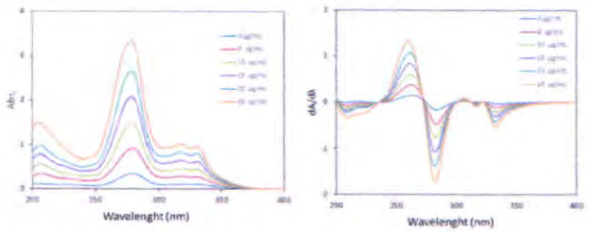

Figure 1. Zero order and first derivative spectra of calibration set

RESULTS:

The proposed method was proved to be accurate, precise, selective and reliable by the validation studies. The average of ten assay results were calculated as 3.47 mg/mL (s=0.03 mg/mL).

CONCLUSIONS:

A simple derivative spectrophotometric method was developed, validated and then it was applied to the determination of ciprofloxacin in eye drop formulations.

REFERENCES:

1. Adenis et al., (1996). European Journal of Ophthalmology, 6:368-374.

P-255: A COMPARATIVE STUDY ON THE LIQUID CHROMATOGRAPHIC RETENTION & SEPARATION CHARACTERISTICS OF SEVEN PARABEN DERIVATIVES IN DIFFERENT COLUMNS

[1,2] Ozcan, S., [1,2] Kozanli, M., [1,2] Can, NO.

[1]Anadolu University, , Faculty of Pharmacy, Department of Analytical Chemistry Eskisehir, Turkey

[2]Anadolu University, Faculty of Pharmacy, Doping and Narcotic Compounds Analysis Laboratory, Eskisehir, Turkey

INTRODUCTION:

Paraben derivatives are widely used as antimicrobial preservatives in foods, cosmetics and pharmaceuticals (1). Variations on the liquid chromatographic retention and separation of seven paraben derivatives, namely methylparaben (MP), ethylparaben (EP), n-propylparaben (NPP), i-propylparaben (IPP), n-butylparaben (NBP), i-butylparaben (IBP) and benzylparaben (BP) were studied by utilizing different types of stationary phases (n=3). The effect of particle structure, retention characteristics, system suitability parameters were investigated, and the results were compared with each other for a brief performance evaluation.

MATERIALS AND METHODS:

Analyses were performed using a Nexera series of UHPLC system, which was composed of the following components (all from Shimadzu, Japan): Two LC-30AD binary pumps equipped with a DGU-A5R on-line degasser for each, an SIL-30AC autosampler, a CBM-20A system controller and an

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JUNE 26-29, 2018 ANKARA, TURKEY

ISOPS 12

CERTIFICATE OF ATTENDANCE

This to certify that

Ratih

has attended the 12th International Symposium on Pharmaceutical Sciences (ISOPS 12), held from June 26th to 29th, 2018, in Ankara, Turkey

Symposium Chair
Prof. Dr. Gülbin ÖZÇELİKAY