

# The deductive approach of redox titration and kinetic-spectrophotometric methods in quantitative determination of ampicillin

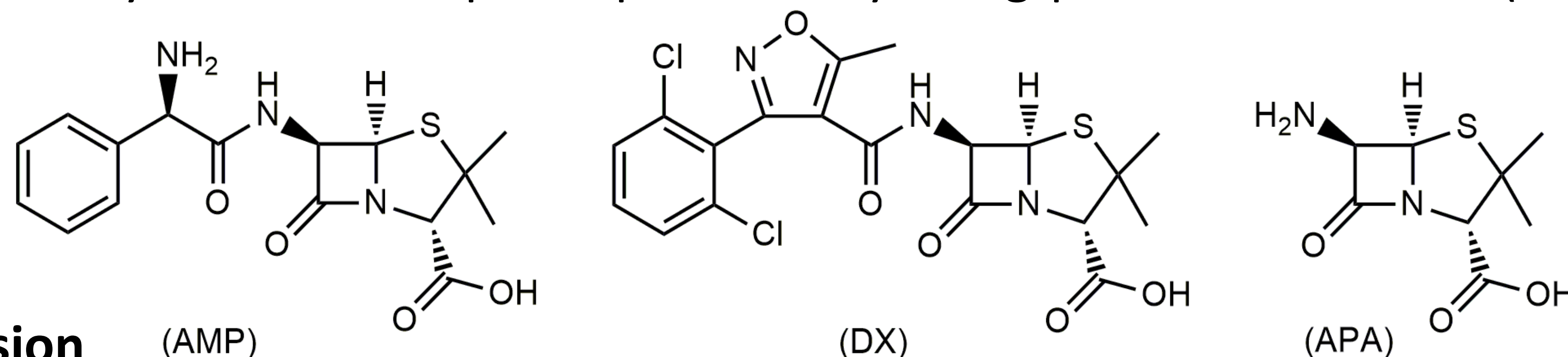
Svitlana Karpova\*, Iryna Zhuravel, Sergiy Kolisnyk, Mykola Golik, Oleg Kryskiv  
National University of Pharmacy, Kharkiv, Ukraine  
\*za9594506@gmail.com

## Introduction

Despite the emergence of new groups of antimicrobial agents, antibiotic drugs of the penicillin series continue to occupy a significant place in pharmacy. In particular, hydrolysis-resistant ampicillin preparations have become widespread. Despite the fact that many methods are used in the practice of analysis, the task of improving the known and developing new methods for the quantitative determination of penicillins remains relevant.

## Materials and methods

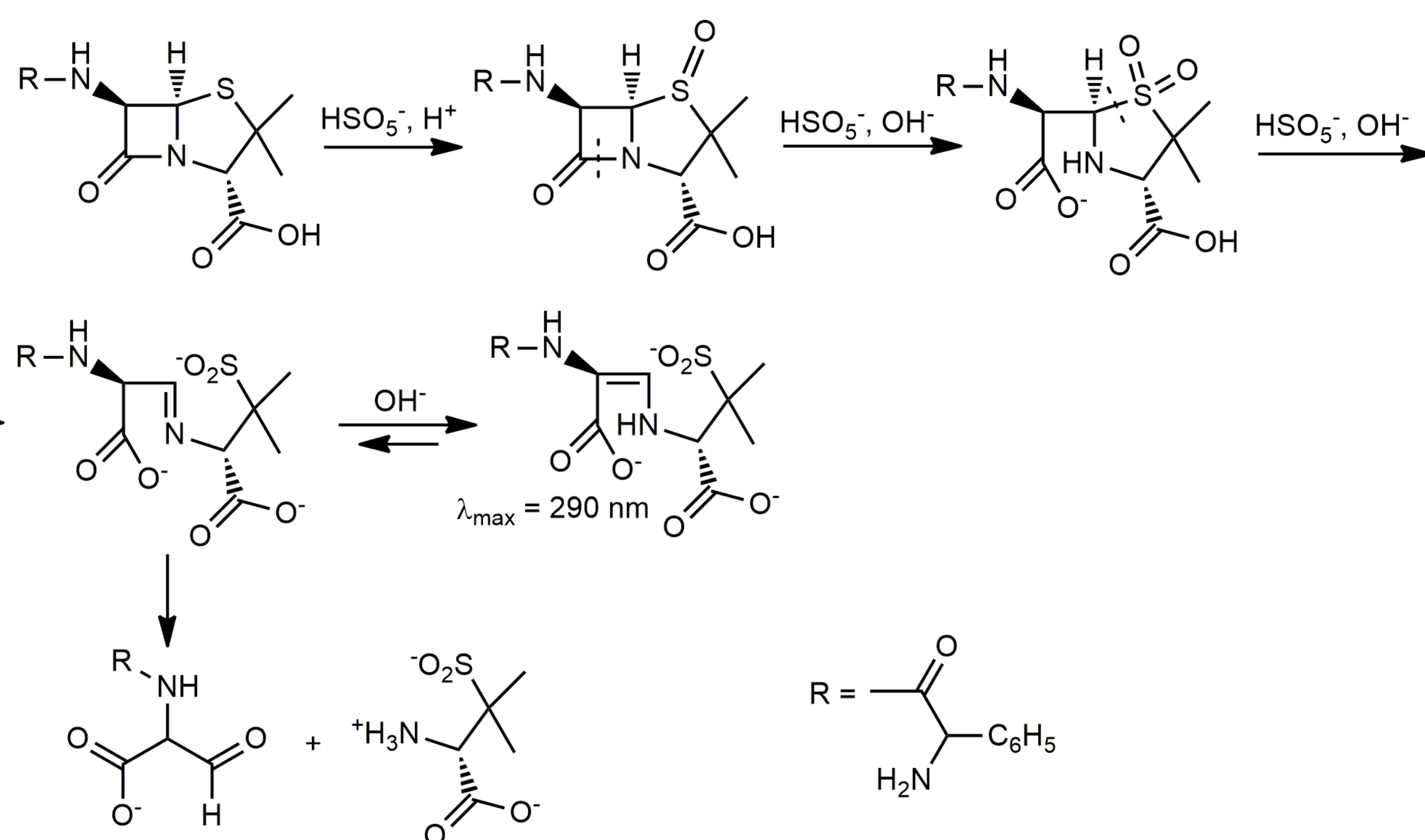
Peroxomonosulphate acid as triple potassium salt  $2\text{KHSO}_5 \cdot \text{KHSO}_4 \cdot \text{K}_2\text{SO}_4$  (Oxone<sup>®</sup>) of "extra pure" qualification was used as oxidant. Active oxygen content is 4.3 % (Acros Organics). For the research, ampicillin sodium salt of pharmacopoeial purity (2S, 5R, 6R)-6-[(2R)-2-amino-2-phenylacetamido]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylate, a dry sterile powder in vials (1.0 g) "MR Ampicillin sodium" produced by "MERRYMED FARM", Namangan, Republic of Uzbekistan was used. We have developed methods for the quantitative determination of antibiotic ampicillin by two alternative procedures of iodometry and kinetic spectrophotometry using potassium caroate ( $\text{KHSO}_5$ ) as an analytical reagent.



## Results and discussion

By the method of reverse redox titration of the  $\text{KHSO}_5$  excess, it was found that in the reaction studied 1 mol of  $\text{KHSO}_5$  was consumed by 1 mol of Amp, and the interaction between them occurred for 1 min.

As a result of the study, it was found that the order of mixing the solutions significantly affected the kinetics and the yield of the reaction product: the highest rate of the product formation was after the preliminary mixing of the Amp solution with  $\text{KHSO}_5$  (the stage of the Amp sulfoxide formation).



## Conclusion

Using the methods of kinetic spectrophotometric and redox titration, two independent procedures for the quantitative determination of ampicillin in the substance and the drug product have been developed using potassium caroate as an analytical reagent ( $\text{KHSO}_5$ ). The developed methods of quantitative determination of ampicillin can be used to develop analytical regulatory documentation for medicinal products, as well as in the practice of state laboratories for quality control of medicinal products and central factory laboratories of pharmaceutical enterprises.

## References

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