

Sudan University of Science and Technology



College of Graduate Studies

Ultraviolet, Visible and Infrared Simultaneous Spectrophotometric Assay of Pyrimethamine and Sulphadoxine in Dicomponent Antimalarial Drugs

التحليل المضوئي الطيفي الأني بالأشعة فوق البنفسجية والمرئية وتحت
الحمراء للبايروميثامين والسلفادوكسين في أدوية مضادات الملاريا ثنائية
التكوين

By

Rehab Abd Elgadir Ibrahim Abd Elwhab

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Supervisor:

Dr. Mohammed Elmukhtar Abd Elaziz

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Dedication

This effort is dedicated to

My dear parents,

Lovely husband,

Brother, sisters and kids.

*Deep appreciation for their moral support, aspiration and
fortitude.*

I hope this degree will make them prouder.

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Abstract

The development of new methods for the assay of active components in dicomponent antimalarial drugs are of great interest to pharmaceutical analysis ,specially in developing countries.

Pyrimethamine and sulphadoxine, in particular, are still of continued use in the chemo- therapy treatment of malaria disease. The growing need to develop more simple ,accurate and sensitive assay methods is obvious. In the present work pyrimethamine and sulphadoxine were spectrophotometrically determined not only in the visible but also in the ultraviolet and infrared regions of the electromagenetic spectrum ,using the two simultaneous equations method .

Whereas the ultraviolet method was based on measurement of the maximum absorbance of pyrimethamine and sulphadoxine at 275 nm and 265 nm, the visible procedure was developed on the bases of their maximum absorbance of their cholaranilic complexes at 520 nm, 500 nm respectively. The Infrared method, however, was based on their characteristic absorbance,(i.e. $-\log_{10}$ transmittance) at 833 nm,1319 nm respectively. In all the three developed simultaneous spectrophotometric assay methods of pyrimethamine and sulphadoxine, contents in

fansidar show a good agreement with those given in the recipe formulation of fansidar drug brand.

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الخلاصة

إن تطوير طرق جديدة لتحليل المركبات الفعالة في عقاقير الملا ريا ثنائية المركبات يجد اهتماما " كبيرا" في التحليل الصيدلاني خاصة في البلاد النامية.

وما زال البايراميسامين و السلفادوكسين يجدان استخداما " واسعا" في العلاج الكيميائي لأمراض الملا ريا .وعليه تتضح الحاجة المتزايدة لتطوير طرق تحليل أكثر بساطة " ,دقة " وحساسية " .

في هذه الدراسة لم يتم تعيين البايراميسامين و السلفادوكسين بالمضوائية الطيفية في منطقة الأشعة المرئية فقط ,بل ايضا" في منطقتي الأشعة فوق البنفسجية و الأشعة تحت الحمراء في الطيف الكهرومغناطيسي باستخدام طريقة المعادلتين الآتيتين .

وبينما طرق الأشعة فوق البنفسجية تعتمد علي قياس الامتصاص الاقصى للبايراميسامين و السلفادوكسين عند 275, 265 نانومتر علي التوالي , تعتمد طرق الأشعة المرئية علي قياس الامتصاص الاقصى لمعقدايهما مع حمض الكلورانيليك عند 520, 500 نانومتر علي التوالي, أما طرق الأشعة تحت الحمراء فتعتمد علي تعيين

الامتصاص المميز(سالب لوغريثم النفاذية) عند 1319,833 نانومتر علي التوالي. كل هذه الطرق التي تم تطويرها للتعين المضوائي الطيفي الآني لمحتوي للبايراميسامين و السلفادوكسين في عقار الفنسيدار تتفق علي ما أعطي في الوصفة الطبية لتركيبه عقار الفنسيدار التجاري

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