

Abstract

p-Quinones are a group of compounds which played a vital role in biological processes through their redox system in the respiratory cycles and blood stream. The chemistry of *p*-quinones including their preparations, reactions and different physicochemical properties were dealt with chapter one of this thesis.

Twelve compounds of *p*-amino-quinone were prepared in this work: four were prepared from 1,4-benzoquinone: 2,5-dianilino-1,4-benzoquinone (Ia), 2,5-disulphamethoxazolyl-1,4-benzoquinone (Ib), 2,5-disulphadoxinyl-1,4-benzoquinone (Ic), 2,5-disulphanil amidyl-1,4-benzoquinone (Id); four were prepared from 2,3,5,6-tetrabromo-1,4-benzoquinone: 3,6-dibromo-2,5-dianilino-1,4-benzoquinone (IIa), 3,6-dibromo-2,5-disulphamethoxazolyl-1,4-benzoquinone (IIb), 3,6-dibromo-2,5-disulphadoxinyl-1,4-benzoquinone (IIc), 3,6-dibromo-2,5-disulphanilamidyl-1,4-benzoquinone (IId); four were prepared from 1,4-naphthoquinone: 2-anilino-1,4-naphthoquinone (IIIa), 2-sulphamethoxazolyl-1,4-naphthoquinone (IIIb), 2-sulphadoxinyl-1,4-naphthoquinone (IIIc) and 2-sulphanil amidyl-1,4-naphthoquinone (IIId). The compounds were prepared according to well established literature methods. They are selected based upon the calculated values of their physiochemical properties especially logP when correlated with the substituted groups.

The identities of the prepared compounds were confirmed by infrared IR, ultraviolet-visible UV-VIS and proton-nuclear magnetic resonance ¹H-NMR spectral analysis and chromatographic examination. Physiochemical properties, Mechanisms of the reactions and the appropriate retrosynthetic analysis were given and discussed in chapter three.

الخلاصة

اكتسبت مركبات ال بارا- كينون اهميتها من دورها الحيوي في عملية التنفس داخل جسم الانسان. و لقد تم في هذا البحث تناول كيمياء ال بارا- كينون بما فيها تحضيرها ، تفاعلاتها و خواصها الفيزيوكيميائية.

تم تحضير ١٢ مركب في هذا المشروع: اربعة مركبات حُضرت من ٤,١- بنزوكينون: ٥,٢-ثنائي الانيلينو-٤,١-بنزوكينون، ٥,٢-ثنائي السلفاميثوكسزوليل-٤,١-بنزوكينون، ٥,٢-ثنائي السلفادوكسينيل-٤,١-بنزوكينون، ٥,٢-ثنائي السلفانيل اميديل-٤,١-بنزوكينون؛ اربعة مركبات حُضرت من ٢,٣,٥,٦-رباعي البروم-٤,١-بنزوكينون: ٦,٣-ثنائي البروم-٥,٢-ثنائي الانيلينو-٤,١-بنزوكينون، ٦,٣-ثنائي البروم-٥,٢-ثنائي السلفاميثوكسزوليل-٤,١-بنزوكينون، ٦,٣-ثنائي البروم-٥,٢-ثنائي السلفادوكسينيل-٤,١-بنزوكينون، ٦,٣-ثنائي البروم-٥,٢-ثنائي السلفانيل اميديل-٤,١-بنزوكينون؛ اربعة مركبات حُضرت من ٤,١-نافثوكينون: ٢-انيلينو-٤,١-نافثوكينون، ٢-سلفاميثوكسزوليل-٤,١-نافثوكينون، ٢-سلفادوكسينيل-٤,١-نافثوكينون، ٢-سلفانيل اميديل-٤,١-نافثوكينون. حضرت هذه المركبات اعتمادا علي طرق تحضير مثبتة مسبقا. و تم اختيارها اعتمادا علي خواصها الفيزيوكيميائية و خاصةً قيم معامل التوزيع $\log P$.

تم التعرف علي البنية التركيبية للمركبات المحضرة عن طريق التحليل الطيفي بواسطة الاشعة تحت الحمراء، الاشعة فوق البنفسجية-الطيف المرئي و الرنين النووي المغنطيسي للهايروجين بالاضافة الي الطرق الكروموتوغرافية. وضعت ميكانيكية هذه التفاعلات اعتمادا علي طريقة التحليل retrosynthetic analysis في الباب الثالث من هذا البحث.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى:

(إِنَّ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لآيَاتٍ لِّأُولِي الْأَلْبَابِ * الَّذِينَ يَذْكُرُونَ
اللَّهَ قِيَامًا وَقَعُودًا وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَذَا بَاطِلًا
سُبْحَانَكَ فَقِنَا عَذَابَ النَّارِ)

صدق الله العظيم

الآيات (١٩٠-١٩١) من سورة آل عمران

Dedication

*To my parents, brothers, sisters and friends for
their unconditional support.*

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List of abbreviations

BQ	Benzoquinone
DMSO	Dimethylsulfoxide
<i>E</i>	electron withdrawn effect
<i>I</i>	inductive effect
IR	infrared spectroscopy
Lit	literature
logP	logarithmic octanol-water partition coefficient
mL	milliliter
mmol	millimole
M.wt	Molecular weight
NQ	naphthoquinone
ppm	parts per million
Re. Temp	Reaction temperature
Rec. solv	Recrystallization solvent
Re. Time	Reaction time
Rf	Retardation factor
Y%	Yield percentage
α	alpha
β	beta