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## Abstract

In this work, dihydropyrimidinone and their sulphur analogue dihydropyrimidinethione derivatives were synthesized by green chemistry approach in order to simplify and improve conditions that has been used traditionally to carry out the conventional Biginelli reaction for the synthesis of these derivatives.

These reactions were performed by three-component condensation of different types of an aldehyde, ethyl acetoacetate, and urea or thiourea at reflux temperature under solvent-free conditions without catalyst to afford the corresponding dihydropyrimidinones and dihydropyrimidinethione in excellent yields(76–96%). Chapter one of this thesis deals basically with the green chemistry, the principles of green chemistry, green technologies. This chapter deals also with dihydropyrimidinone and dihydropyrimidinethione derivatives together with a review of their biological importance.

In this work 10 dihydropyrimidinone and dihydropyrimidinethione derivatives were synthesized. The reaction course was followed by m.p and TLC technique. All the final products were subjected to UV and IR analysis. Furthermore, products were analyzed with GCMS and <sup>1</sup>HNMR. Possible mechanistic explanation of the synthetic route together with their retrosynthetic analysis were dealt with in chapter three.

## الخلاصة

في هذا العمل خلقت مشتقات الدايهيدروبيريمايدينون (Dihydropyrimidinone) و شبيهة الكبريتي الدايهيدروبيريمايدينثيون ((Dihydropyrimidinethione باستخدام نهج الكيمياء الخضراء وذلك لتبسيطة وتحسين الظروف التي يجب توفرها لتفاعل بيقتلي (reaction Biginelli) التقليدي لتخليق مشتقات الدايهيدروبيريمايدينون (Dihydropyrimidinone) و الدايهيدروبيريمايدينثيون ((Dihydropyrimidinethione. وتم التفاعل بتكثيف لثلاثة مكونات من الألدهيد ، اساييل اسيتو اسيتيت، واليوريا أو ثيويوريا في درجة حرارة التكثيف بدون استخدام مذيب او محفز لتعطى بالمقابل الدايهيدروبيريمايدينون (Dihydropyrimidinone) و الدايهيدروبيريمايدينثيون ((Dihydropyrimidinethione بنواتج ممتازة (76-96%). الفصل الأول يتناول بشكل أساسي الكيمياء الخضراء، ومبادئ الكيمياء الخضراء، والتكنولوجيات الخضراء. هذا الفصل يتناول أيضا مشتقات الدايهيدروبيريمايدينون (Dihydropyrimidinone) و الدايهيدروبيريمايدينثيون ((Dihydropyrimidinethione جنبا إلى جنب مع استعراض لأهميتها البيولوجية.

في هذا العمل تم تخليق 10 مشتقات من الدايهيدروبيريمايدينون (Dihydropyrimidinone) و الدايهيدروبيريمايدينثيون ((Dihydropyrimidinethione. وتتبع مسار التفاعل بتحديد درجة الانصهار (melting point) وتقنية كروماتوغرافيا الطبقة الرقيقة ((TLC. وخضعت جميع النواتج النهائية لتحليل الأشعة فوق البنفسجية ((UV والأشعة تحت الحمراء ((IR. وعلاوة على ذلك تم تحليل النواتج ب (GCMS) و ( $^1\text{HNMR}$ ). وقد تم تناول شرح الآلية المحتملة لمسار التخليق مع تحليل الضديد تخليقي (retrosynthetic) في الفصل الثالث.

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