SYNTHESIS OF NEW ENANTIOPURE THIOUREAS DERIVED FROM (S)-PROLINE INTRODUCTION 6 h 53 Thiourea derivatives are widely explored in the area of organocatalysis and asymmetric	TỔNG HỢP ENANTIOPURE THIOUREAS MỚI CÓ NGUỒN GỐC TỪ (S)-PROLINE GIỚI THIỆU Các dẫn xuất Thiourea đã được khai thác rộng rãi trong lĩnh vực xúc tác hữu cơ và tổng hợp bất

synthesis. They are known as relatively easily available and effective organocatalysts for Strecker reaction, Mannich reaction, Michael reaction, and many others.1,2 Especially attractive are thiourea derivatives containing pyrrolidine ring, because of the presence of the secondary nitrogen atom and stereogenic center located on the C(2) atom.3-6 Several papers describing this type of thioureas were published recently.7,8

đối xứng. Chúng được biết đến với tư cách là những chất hóa học có trữ lượng dồi dào và là các chất xúc tác hữu cơ hiệu quả cho phản ứng Strecker, phản ứng Mannich, phản ứng Michael, và nhiều phản ứng khác. 1,2 Trong đó đặc biệt thu hút là các dẫn xuất thiourea chứa vòng pyrrolidine, do sự hiện diện của nguyên tử nitơ thứ cấp (thứ hai) và tâm stereogenic nằm ở nguyên tử C(2.3-6 Một số bài báo mô tả về loại thioureas này đã được công bố gần đây. 7, 8

RESULTS

The goal of the present study was the synthesis of a series of optically active pyrrolidine derivatives 10 functionalized with thiourea moiety. The key starting material was enantiopure, commercially available (S)-proline (1). N-Boc-(S)-2-aminomethylpyrrolidine (6) was synthesized in fair overall yield based on the known literature protocols.9,10 The initial step was the protection of the N-atom of pyrrolidine ring. Next, alcohol 3 obtained after reduction of the carboxylic function, was treated with tosyl chloride yielding tosylate

KẾT QUẢ

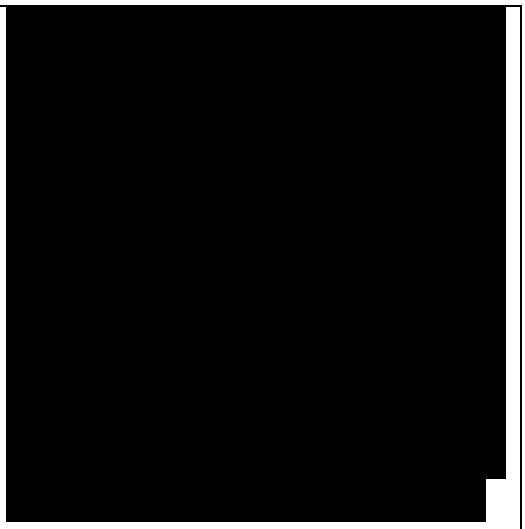
Mục tiêu của nghiên cứu này là tổng hợp một loạt các dẫn xuất pyrrolidine có hoạt tính quang học 10 chức hóa với thiourea

[redacted]

4. The latter was converted into the azide 5, which upon hydrogenolysis, performed in the presence of Pd/C, gave the desired amine 6 (Scheme 1). Its spectroscopic data perfectly fitted with those given in a recent literature report.10

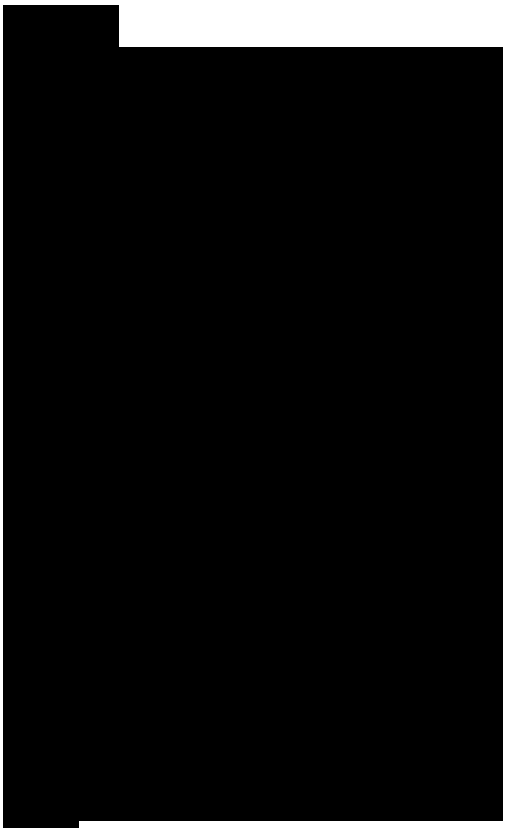
Scheme 1

On the other hand, a series of thioisocyanates 8 was prepared by the reaction of thiophosgene with the corresponding primary amines 7 in dichloromethane at 0°C, in the presence of sodium bicarbonate using a two-phase system (Scheme 2). The IR spectra registered for products 8 displayed the presence of a strong absorption band at ca. 2200 cm-1, characteristic for the —N=C=S group.



Scheme 2

Thioureas 9a-f were synthesized by the reaction of amine 6 with thioisocyanates 8a-f under mild conditions (Scheme 3). Finally, deprotection of the N-atom by treatment of 9 with trifluoroacetic acid (TFA) in dichloromethane solution at 0°C led to the target products 10, which were purified either by column chromatography or by crystallization. All products 10 were obtained as crystalline materials in good yields. In the 13C NMR spectra, characteristic absorption of the C=S group appeared in the region 157-160 ppm.



Scheme 3

CONCLUSIONS

A series of enantiopure thioureas 10a-f containing the N-unprotected pyrrolidine ring was obtained and characterized by means of spectroscopic methods. All of them are attractive as organocatalysts and/or ligands. Their exploitation as organocatalysts in diverse asymmetric reactions is in progress.

	[redacted]