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Trans-Anethole isolated from Star Anise for (3+2) Cycloaddition Reaction Applications.

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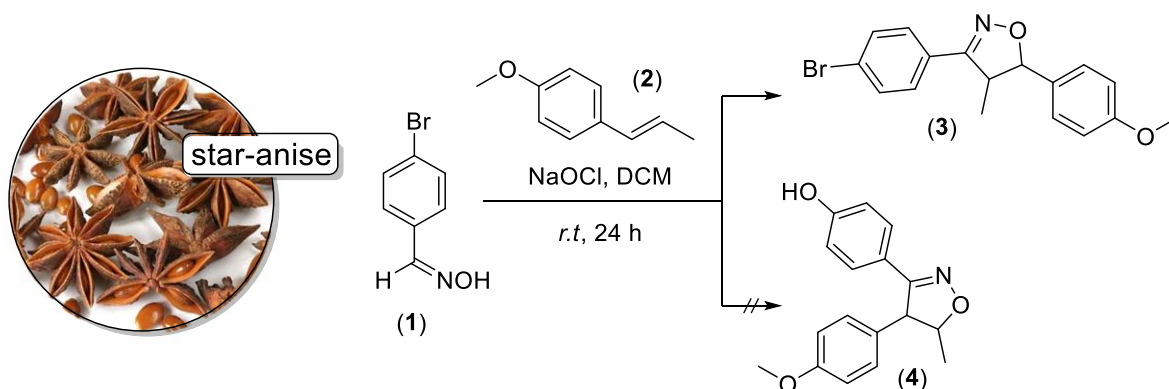
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ABSTRACT

In this report, an experimental classroom through extraction, characterization, and application of *trans*-anethole from raw star-anise oil was conducted by undergraduate students. Initially, the star-anise oil was extracted by hydrodistillation in a Clevenger apparatus, yielding an oil yellowish material with a high *trans*-anethole content. The extracted oil was then characterized by RMN, FT-IR, and HRMS. The oil with higher content of *trans*-anethole (**2**) was utilized as a dipolarophile in a dipolar (3+2) 1,3-dipolar cycloaddition reaction with 4-bromobenzaldoxime (**1**) to afford a new highly functionalized 3,5-isoxazoline cycloadduct (**3**) with regioselectivity in favor of **3**. This sequence of experimental steps allowed the students to gain hands-on experience in the extraction techniques in raw natural materials, its comprehensive characterization using spectroscopic techniques, and its subsequent use in as a green building block in an organic synthesis to produce 5-membered heterocyclics. This study highlights the educational value of engaging undergraduate students in research-oriented projects, providing them with skills and insights into the field of natural product chemistry and organic synthesis.



Scheme 1. Synthesis of isoxazoline from *trans*-anethole

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