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# A simple and green procedure for the synthesis of stilbenoids by one-pot reaction

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## PURPOSE OF THE ABSTRACT

Stilbenoids are hydroxylated derivatives of stilbenes with numerous significant biological properties including antioxidant, anti-tumor and anti-inflammatory effects[1]. Among them, benvitimod can be used as a drug for the treatment of allergic dermatitis and eczema, and resveratrol is widely used in food, cosmetics and health care products industries, and all are recognized to be the representatives of trans-polyhydroxylated stilbenes[2]. These compounds are only produced in response to stress situations such as fungal infection or injury and the contents of which are extremely poor in plants. For this reason, it is hardly to be obtained in large quantities from plants. To overcome this, many synthetic approaches such as Perkin, Heck, Wittig and Suzuki cross-coupling reactions for the synthesis of polyhydroxylated stilbenes and their analogues have been developed.

Resveratrol and other typical trans-polyhydroxylated stilbenes can be synthesized by classical approaches such as Wittig reaction at present time[3]. The formation of carbon-carbon double bond in trans-configuration is the key step in the synthetic process, and in many cases a mixture of cis-/trans- isomers of polymethoxylated stilbenes is produced by Wittig reaction. An extra work is required to transform the cis-isomer to trans-stilbenes, which is promoted by iodine or phenyl sulfide. Then, the demethylation of those trans-stilbenes is usually carried out in the presence of AlI3 or BBr3, and the reaction conditions are harsh. These shortcomings consequently limit the benefits of these approaches from an applied standpoint. Therefore, the development of more green and simple synthetic methods for preparation of trans-polyhydroxylated stilbenes is very important.

In this report, we report a one-pot, efficient and green procedure for the synthesis of resveratrol, piceatannol and pinosylvin, through a simultaneous demethylation and isomerization process with the aid of aluminum and iodine. General procedure for the synthesis of these compounds is that a mixture of aluminum, iodine and cis-/trans-isomers of polymethoxylated stilbenes (the ratio of isomers is about 1:1) in CH3CN was stirred at 75 oC for about 5h. All the trans- polyhydroxylated stilbenes were obtained in high overall yields including the 80% yield of resveratrol based on cis-/trans- isomers of polymethoxylated stilbenes. Moreover, the solvent of this process can be recovered by simple filtration and reused.

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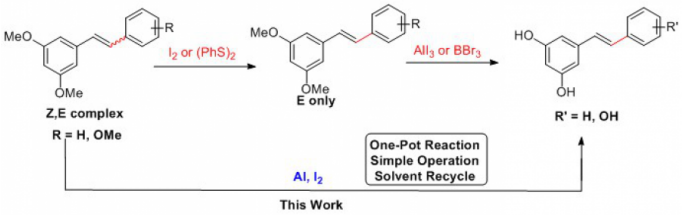
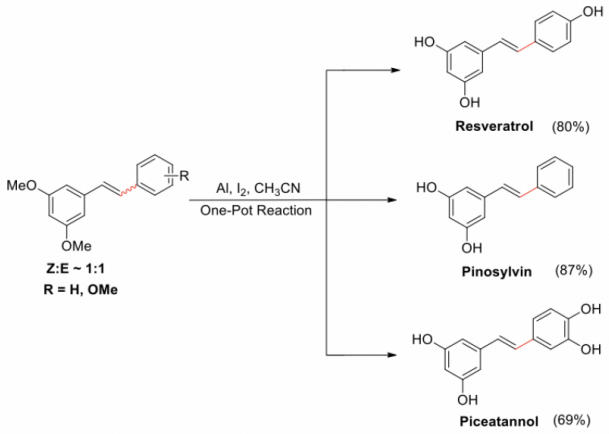
## FIGURES




### FIGURE 1

General route to polyhydroxylated stilbenes

Synthesis of trans-polyhydroxylated stilbenes via demethylation

### FIGURE 2

Application of the one-pot isomerization/demethylation strategy

One-pot synthesis of resveratrol, piceatahnol and pinosylvin


## KEYWORDS

resveratrol | stilbenoids | one-pot reaction | demethylation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