

# Palladium catalyzed Heck-lactonization from *ortho*-iodophenols and enoates: Synthesis of coumarins and the study of the mechanism by electrospray ionization mass spectrometry

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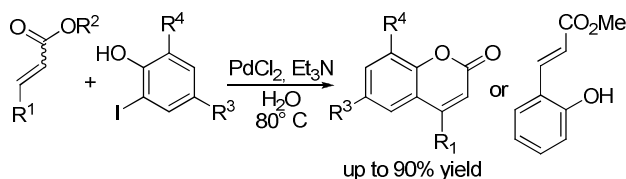
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## INTRODUCTION

The arylation of olefins, discovered by Heck and Mizoroki, is one of the most important palladium-catalyzed carbon-carbon coupling reactions.<sup>1</sup> Coumarins display many biological activities<sup>2</sup> and more recently, could be obtained by Heck-lactonization reaction.<sup>3</sup>

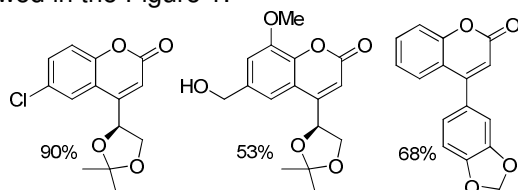
## RESULTS AND DISCUSSION

In earlier studies by our research group, the tandem Heck-lactonization reaction between enoates and *ortho*-iodophenols leading to the corresponding coumarins was investigated under several conditions and three procedures were selected.<sup>3c</sup> More recently, we extend the scope of this reaction (Scheme 1) and studied this reaction by electrospray ionization mass spectrometry.<sup>4</sup>



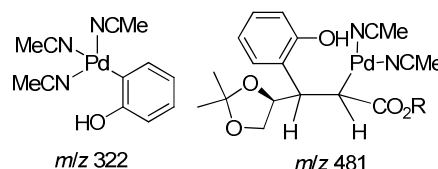
**Scheme 1.** Heck and Heck-lactonization reaction in aqueous medium.

A lot of coumarins, with withdrawing and releasing groups, was synthesized and some examples are showed in the Figure 1.



**Figure 1.** Some coumarins synthesized by Heck reaction.

Intercepted cations by ESI-MS experiment are showed in Figure 2.



**Figure 2.** Intercepted cations by MS(+)-MS, after dilution in MeCN.

## CONCLUSION

Heck-lactonization reaction gives coumarins in a simple way, in aqueous medium and absence of ligands and the ESI-MS experiment suggest that this reaction goes to the cationic mechanism.

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