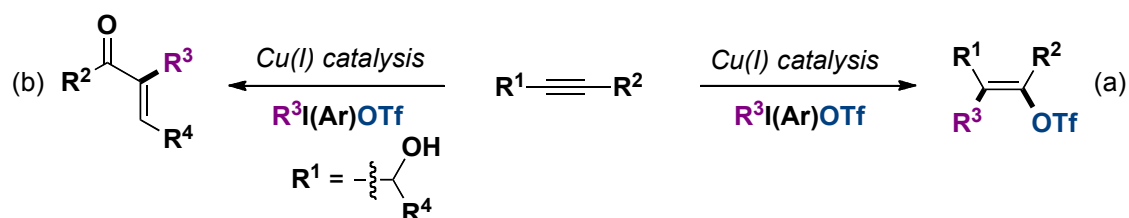


Over the past decades diaryliodonium salts (Ar_2IX) have emerged as powerful electrophilic arylative reagents for many classical transformations such as α -arylation of carbonyl compounds, arylation of a wide range of heteroatom nucleophiles or benzyne generation.¹ In the last years these electrophilic systems have been involved in novel metal-catalyzed C–H arylation of heterocycles and substituted arenes. The Gaunt group have been developing a new strategy for the selective functionalization of these class of molecules using diaryliodonium salts and copper catalysis, observing a remarkable reverse of established metal-catalyzed reactions.² On the other hand, during the fellowship period a new activation mode of alkynes has been discovered using iodonium salts and copper catalysis. In this sense a simple and efficient synthesis of highly substituted vinyl triflates via a copper-catalyzed difunctionalization of internal and terminal alkynes with iodonium salts has been developed (a). During the development of this transformation and extension of the reaction scope we discovered a novel reaction involving an arylative rearrangement of propargylic alcohols with iodonium salts under copper catalysis (b). High densely functionalized unsaturated ketones, a motif commonly used as a basic scaffold in heterocyclic chemistry, are formed in an efficient manner and as a single stereoisomer. These novel transformations display a broad scope in the class of alkyne used (symmetrical, unsymmetrical, terminal) and in the nature of the iodonium salt (aryl, heteroaryl, alkenyl, alkynyl) that can be transferred. To explain the outcome of these novel reactions, a highly electrophilic copper(III)-aryl species has been proposed.



During the course of the Marie Curie fellowship the researcher developed good teaching skills through the supervision of twelve students in advanced chemistry courses (The Foundations of Organic Synthesis, Stereocontrolled Organic Synthesis and New Synthetic Methods). He had the opportunity of supervising four PhD students, one Part III student and one summer student, allowing him to develop managerial and teamwork skills. His exceptional results have been presented in international congresses (ACS National Meeting & Exposition, 2012, San Diego, California; oral communication) and prestigious international workshops (Bayer Postdoc Workshop, May 2012, New York; poster). In the near future he is going to present an oral communication in his home country (Spanish Organic Chemistry Congress, San Sebastian, July, 2012) allowing him to make conexions for future academic collaborations. As a result of his achievements he is being involved in the preparation of a couple of manuscripts for the publication of these novel transformations.

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