

Title: **Direct, catalytic and asymmetric alkylation reactions. A General overview.**

Student: Vicky Cubells Herrera

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Supervisor/s: Dr. Fèlix Urpí Tubella

Departament of Inorganic and Organic Chemistry

The stereoselective construction of carbon-carbon (or carbon-heteroatom) bonds is one of the most important transformations in organic synthesis. Metal complexes can catalyze such processes, but just a few of them are able to promote the selective enolization of a carboxylic acid derivative and provide environment to react enantioselectively with a variety of electrophiles.

It can also be found in the literature alkylation processes that pass through S_N1 -type mechanisms. A wide array of new *N*-acyl derivatives are employed in a number of direct and enantioselective carbon-carbon-bond-forming reactions catalyzed by nickel(II) complexes. The resultant adducts are isolated as single diastereomers in high yields and can be converted into enantiomerically pure derivatives in a straightforward manner.

Keywords: enantioselective reactions, nickel-catalyzed reactions, S_N1 -type mechanisms, *N*-acyl derivatives, alkylation processes, direct reactions, carbon-carbon-bond-forming reactions.