

## Summary

In this doctoral thesis, synthetic processes for achieving new platform molecules with both pharmacological and chemical interest have been developed. For this purpose, bifunctional catalytic systems have been used in order to perform different reaction steps in the same synthetic sequence, using both metallic centers and acids of high surface area in the same catalytic system. The recovery study of these catalysts has also been addressed, in order to reuse them in subsequent synthetic cycles, thus contributing to the development of more efficient and sustainable processes.

Chapter 3 is focused on the pyrimidinone-type structures synthesis from alcohols, using Pd-based catalysts supported in both sulfonic resins (Nafion SAC 13) and deposited in heteropolylic acids (APT) in  $ZrO_2$  (APT- $ZrO_2$ ). In addition, this pyrimidinone structure has been modified by means of a third transesterification step to obtain, among others, a product with pharmacological activity as an inhibitor of fatty acids transport.

In Chapter 4, a one-pot oxidation-hydroalkylation-alkylation reaction has been carried out to obtain triarylmethane-type structures from alcohols and activated arenes by means of a palladium catalyst supported on a tungsten and zirconium mixed oxide (Pd/ $WO_x$ - $ZrO_2$ ). Special attention has been paid to the influence of the calcination temperature as well as the tungsten and palladium loading in the catalyst. In addition, a stable fixed bed system has been developed, which showed to be capable of carrying out this same reaction during cycles of up to 72 hours and the on-site regeneration of the catalyst for later uses.

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In Chapter 5, using the same palladium supported in tungsten and zirconium oxide (Pd/WO<sub>x</sub>-ZrO<sub>2</sub>) catalyst, the operating conditions for the formation of compounds with 11 and up to 17 carbon atoms has been optimized. Those structures could be used as kerosene (in the case of 11 carbon atoms compounds) or diesel (in the case of 17 carbon atoms) additives or as precursors of liquid fuels.