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Nanomagnetic Phosphotungstic acid-catalyzed Chemoselectivity esterification of Carbonyl bond of alpha-chloroacetic acid

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Esterification of alpha-chloroacetic acid with water soluble alcohols in the liquid phase using sustainable methods is the first challenge in the way of the total synthesis of polymer solar cells (PSCs) [1]. Carboxylic acid esterification is one of the basic reactions in organic chemistry, the speed of which can be increased by increasing the acidic catalyst to the reaction medium [2,3]. In the reaction of esterification both homogeneous and heterogeneous catalysts can be used. Among the heterogeneous catalyst that can be used, phosphotungstic acid stabilized on nanomagnetic Hercynite as a spinel normal catalytic support used to esterification alpha-chloroacetic acid with different water miscible and immiscible alcohols to prepare the corresponding esters in excellent yields, and without removing the chlorine group at the alpha position through substitution reactions. The advantage of this is the very easy separation of catalyst from the reaction medium by the magnet. In fact, the application of magnetic nanoparticles in the catalysts as a catalyst base has been considered due to the good spread, the surface to volume ratio, the ease of surface modification, and the very easy and effective separation of the reaction medium.

Keywords: Hercynite@SiO_2-PTA, Fischer esterification, alpha-chloroesters, Solid acid catalyst.



Figure 1. Synthesis of alpha-chloroesters through fisher esterification over the catalysis of Hercynite@SiO_2-PTA.

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