

H₆P₂W₁₈O₆₂.14H₂O Catalyzed Synthesis and X-Ray Study of α-Aminophosphonates

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Abstract : The α-aminophosphonates have received considerable attention in organic and medicinal chemistry because of their structural resemblance with α-amino acids. They are used as antitumor agents, anti-inflammatory and antibiotics. As a result, a number of procedures have been developed for their synthesis. However, many of these methods suffer from some disadvantages such as long reaction times, environmental pollution caused by utilization of organic solvents, and expensive catalyst. On the other hand, thiazole components, particularly 2-aminothiazole is an important class of heterocyclic compounds. They appear in the structure of natural products and biologically actives compounds, thiamine (vitamin-B), and some antibiotics drugs (penicillin, micrococcin). In the past few years, heteropolyacids have received great attention as environmentally benign catalysts for organic synthetic processes, they possess unique physicochemical properties, such as super-acidity, high thermal and chemical stability, ability to accept and release electrons and high proton mobility, and the possibility of varying their acidity and oxidizing potential. In this study, an efficient and eco-friendly process has been developed for the synthesis of α-aminophosphonates containing aminothiazole moiety via Kabachnik-Field reaction catalyzed by H₆P₂W₁₈O₆₂.14H₂O as reusable catalyst, by condensation of aromatic aldehydes, 2-aminothiazole and triethylphosphite under free conditions. The X-ray crystallographic data of obtained compounds were provided. The main advantages of our protocol include the absence of solvent in the reaction, easy work-up, short reaction time, atom-economy and reusability of catalyst without significant loss of its activity.

Keywords : aminophosphonates, green synthesis, H₆P₂W₁₈O₆₂.14H₂O catalyst, x-ray study

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