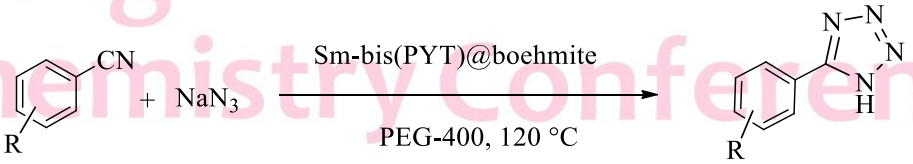
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A novel complex of samarium on boehmite nanoparticles as an efficient and reusable nanocatalyst for the synthesis of tetrazoles

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Boehmite is one of the attractive mineral materials, which was recently employed as support in the synthesis of heterogenous catalysts [1]. Boehmite consists of double layers of octahedron structure from oxygen and a central aluminum atom with a cubic orthorhombic unit cell [2]. Boehmite nanomaterials have unique properties such as excellent surface area, nanometer size of crystallite, easy availability, non-toxicity, and thermal stability [3]. Beside, samarium has rarely been reported as a catalyst for the synthesis of organic compounds. Regarding the fact that selective and reusable catalysts are the main principles of green chemistry, herein a new samarium complex on boehmite nanoparticles (Sm-bis(PYT)@boehmite) was investigated as a selective and recyclable nanocatalyst in the synthesis of 5-substituted 1H-tetrazole derivatives in PEG-400 as a green solvent. Because, tetrazoles are an important group of organic compounds which can be used in various fields such as coordination chemistry, drugs, synthetic organic chemistry, medicinal chemistry [4]. Sm-bis(PYT)@boehmite was characterized using thermogravimetric analysis (TGA), Brunauer-Emmett-Teller (BET), wavelength dispersive X-ray spectroscopy (WDX), energy dispersive X-ray spectroscopy (EDS), scanning electron microscope (SEM), dynamic light scattering (DLS), Inductively coupled plasma mass spectrometry (ICP-MS), Fourier transform infrared spectroscopy (FT-IR), and X-ray diffraction (XRD) pattern. Notably, Sm-bis(PYT)@boehmite is stable and has a heterogeneous nature. Thus, it can be reused for several runs without any re-activation.

Keywords: Green Solvent, Boehmite Nanoparticles; Reusable Catalyst; Environmentally Friendly Catalyst, Homoselective Catalyst, Tetrazole



Scheme 1. synthesis of tetrazoles in presence of Sm-bis(PYT)@boehmite nanocatalyst.

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