

Preparation of butyl acetate using solid acid catalysts:

Textural and structural characterization

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Abstract:

Acid type catalysts, Alumina supported tungstophosphoric acids (APWH), $\text{WO}_3\text{-ZrO}_2$ (WZ) and sulphated $\text{WO}_3\text{-ZrO}_2$ (SWZ) was prepared.

The textural properties of different samples were determined, while the structural characteristics were investigated using different techniques, including XRD, DTA-TGA and FT-IR.

The esterification of acetic acid with 1-butanol was examined for all the calcinations products samples, studying herein reaction time, catalyst weights, and reaction temperatures.

It is evident that, the chemical composition, as well as the calcinations temperatures affected the textural parameters.

The investigation of the structural characteristics for APWH systems showed that the impregnant PWH lost its thermal stability up on heating at $\geq 300^\circ\text{C}$. Moreover, For ZW system, $\text{WO}_3\text{-ZrO}_2$ is the only detectable phase in WZ system and the presence of WO_3 result in stabilizing the surface sulphated group in sulphated $\text{WO}_3\text{-ZrO}_2$ system.

Examining the esterification activities indicated that the sulphated $\text{WO}_3\text{-ZrO}_2$ is the most efficient catalysts, giving 85.6% ester.