

硫酸盐水合物催化下的酯化反应 I: 反应级数,活化能及催化剂活性的测定

黄化民,刘福安,徐之雒,钟熙宁

吉林大学化学系

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摘要

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Study of esterification reactions catalyzed by hydrated sulphate salts I: Determination of the order and the activation energy of reaction and the activity of catalysts

HUANG HUAMIN,LIU FUAN,XU ZHILUO,ZHONG XINING

Abstract The order of esterification reaction of acetic acid and ethanol catalyzed by $\text{Fe}_2(\text{SO}_4)_3 \cdot 7\text{H}_2\text{O}$ and $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ has been determined. The reaction order was found to be 2 with respect to acid and ethanol with constant quantities of catalysts. The activity of catalysts can be expressed by Y_m value, which is different from catalyst to catalyst. For $\text{Fe}_2(\text{SO}_4)_3 \cdot 7\text{H}_2\text{O}$, $\text{Cr}_2(\text{SO}_4)_3 \cdot 6\text{H}_2\text{O}$, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{CoSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and $\text{MnSO}_4 \cdot 5\text{H}_2\text{O}$ the Y_m values are 1.52, 1.21, 0.62, 0.42, 0.47, 0.25, 0.10 and 0.00 respectively. A linear relationship of Y_m with the fraction of the second ionization potential (P) over radius (r) of metal ion of sulphate salts was found to be $Y_m = \alpha(P/r) + b$.

Key words [ETHANOL](#) [CATALYST](#) [ESTERIFICATION](#) [ACTIVITY](#) [SULFATE](#) [HYDRATE](#) [ACETIC ACID](#) [ACTIVATION ENERGY](#)

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