Synthesis of Acetamide Compounds from α-Pinene through Sonochemical Ritter Reaction with Ni/Natural Zeolite Catalyst

by Khoirun Nisyak

Submission date: 02-Aug-2023 06:57PM (UTC-0700)
Submission ID: 2140626797
File name: KN_for_ICOAC_UB.ppt (3M)
Word count: 395
Character count: 2157

Synthesis of Acetamide Compounds from α-Pinene through Sonochemical Ritter Reaction with Ni/Natural Zeolite Catalyst

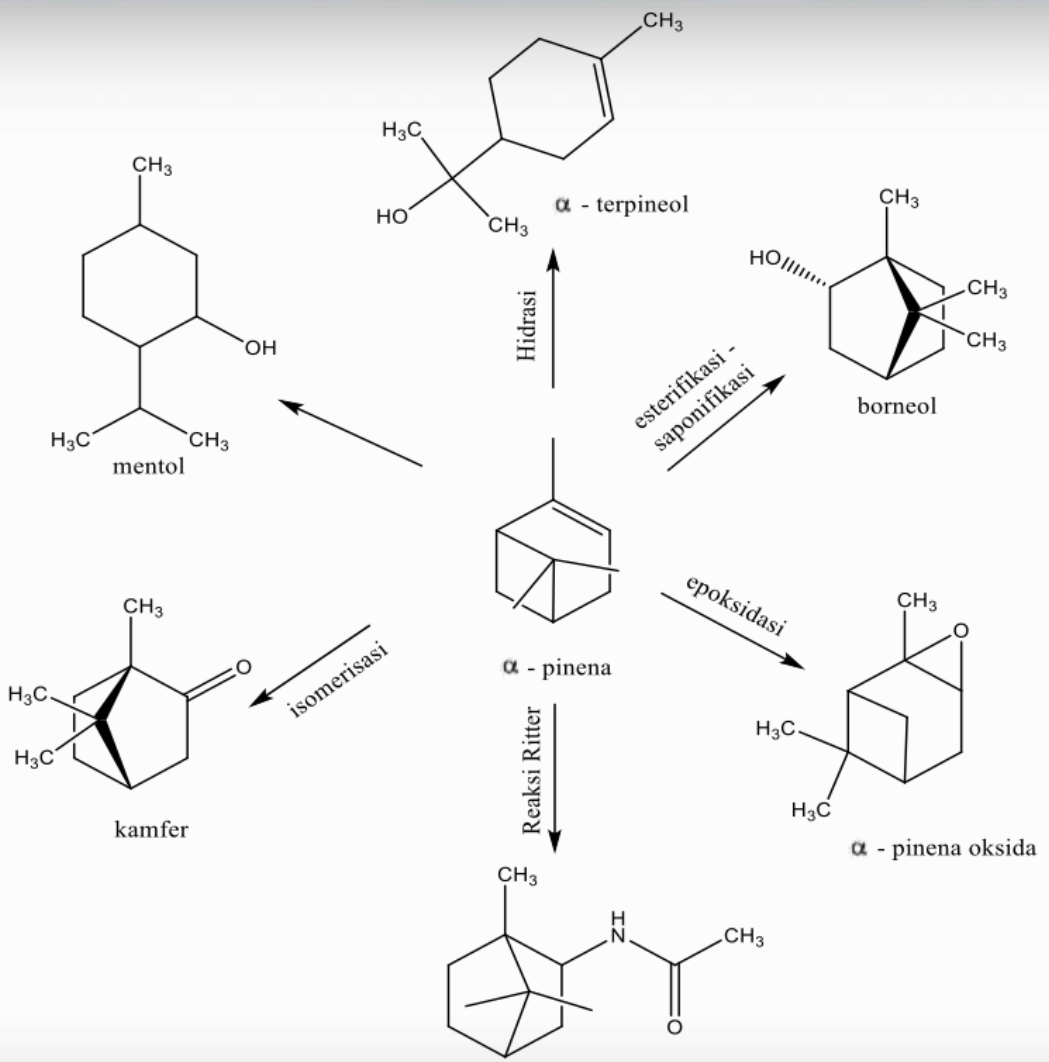
Khoirun Nisyak*, A'yunil Hisbiyah, and Desi Phingkarsa
Dept. of Pharmacy, Universitas Anwar Medika, Sidoarjo, Indonesia

Malang, 14 Oktober 2022
International Conference on Organic and Applied Chemistry
Universitas Brawijaya

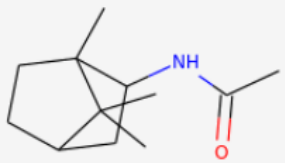
INTRODUCTION

Terpentine oil

alpha pinene was modified into organonitrogen compounds through the Ritter reaction.



Molecule Depiction



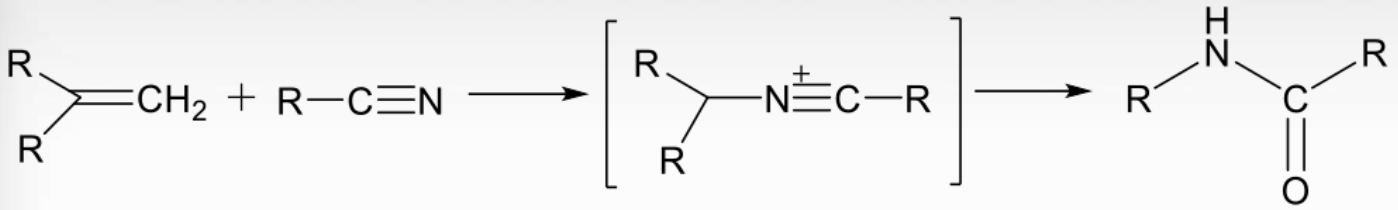
SMILES

Molecule properties:

Descriptor	Value
Molecular Weight	195.306
LogP	2.3373
#Rotatable Bonds	1
#Acceptors	1
#Donors	1
Surface Area	86.453

Property	Model Name	Predicted Value	Unit
Absorption	Water solubility	**-2.996**	Numeric (log mol/L)
Absorption	Caco2 permeability	**1.638**	Numeric (log Papp in 10^{-6} cm/s)
Absorption	Intestinal absorption (human)	**94.681**	Numeric (% Absorbed)
Absorption	Skin Permeability	**-2.61**	Numeric (log Kp)
Absorption	P-glycoprotein substrate	**No**	Categorical (Yes/No)
Absorption	P-glycoprotein I inhibitor	**No**	Categorical (Yes/No)
Absorption	P-glycoprotein II inhibitor	**No**	Categorical (Yes/No)
Distribution	VDss (human)	**0.279**	Numeric (log L/kg)
Distribution	Fraction unbound (human)	**0.44**	Numeric (Fu)
Distribution	BBB permeability	**0.575**	Numeric (log BB)
Distribution	CNS permeability	**-2.207**	Numeric (log PS)
Metabolism	CYP2D6 substrate	**No**	Categorical (Yes/No)

Ritter Reaction



ACID CATALYST

Ni/N-Zeolite ➡ natural zeolite based heterogeneous catalyst with the addition of Ni

the addition of Ni metal can increase the acidity value which can increase its catalytic activity

The use of ultrasonic waves in the synthesis of chemical compounds encourages physical and chemical changes in liquid media and causes acoustic cavitation

OBJECTIVE

- The purpose of this study ➔

1. to determine the reaction products obtained from the synthesis of acetamide compounds from -pinene through the Ritter reaction sonochemically using Ni/Natural Zeolite catalysts
2. To determine the effect of the type of catalyst for the synthesis of acetamide compounds from -pinene through the sonochemical Ritter reaction

METHODS

Activation of Natural Zeolite

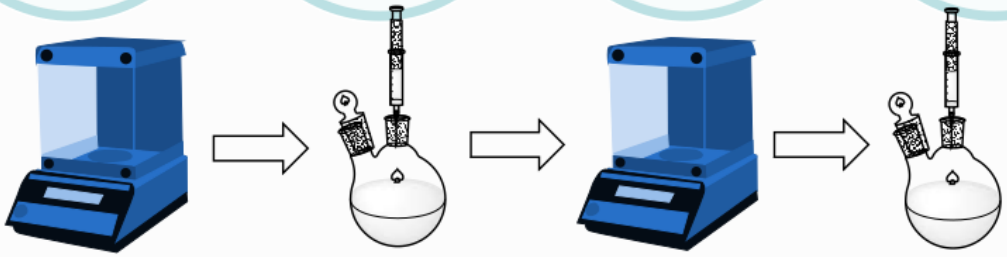
Impregnation of Ni to Zeolite

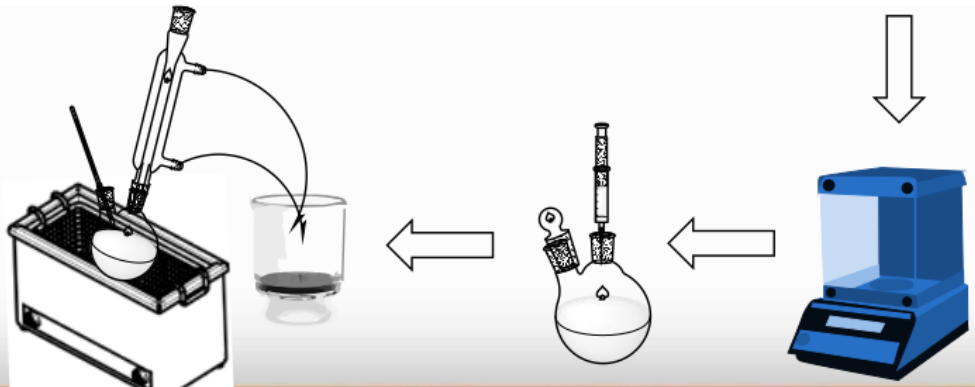
Characterization of catalyst

Synthesis Acetamide Compound

Separation of product

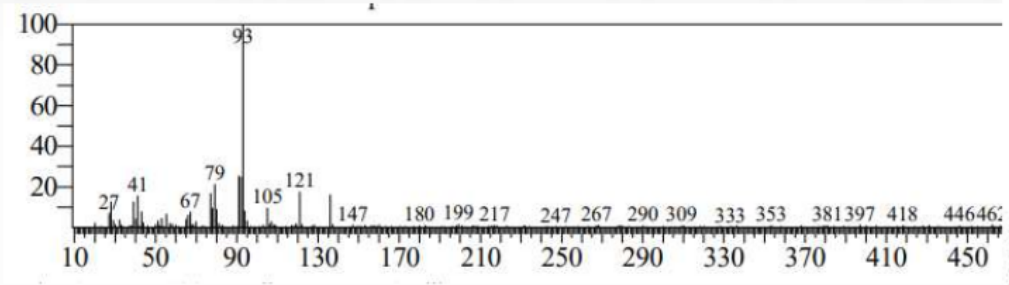
Characterization of product

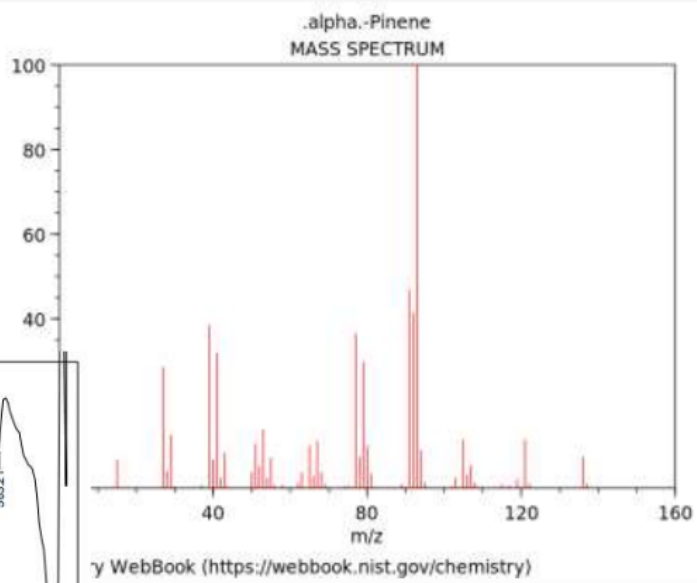


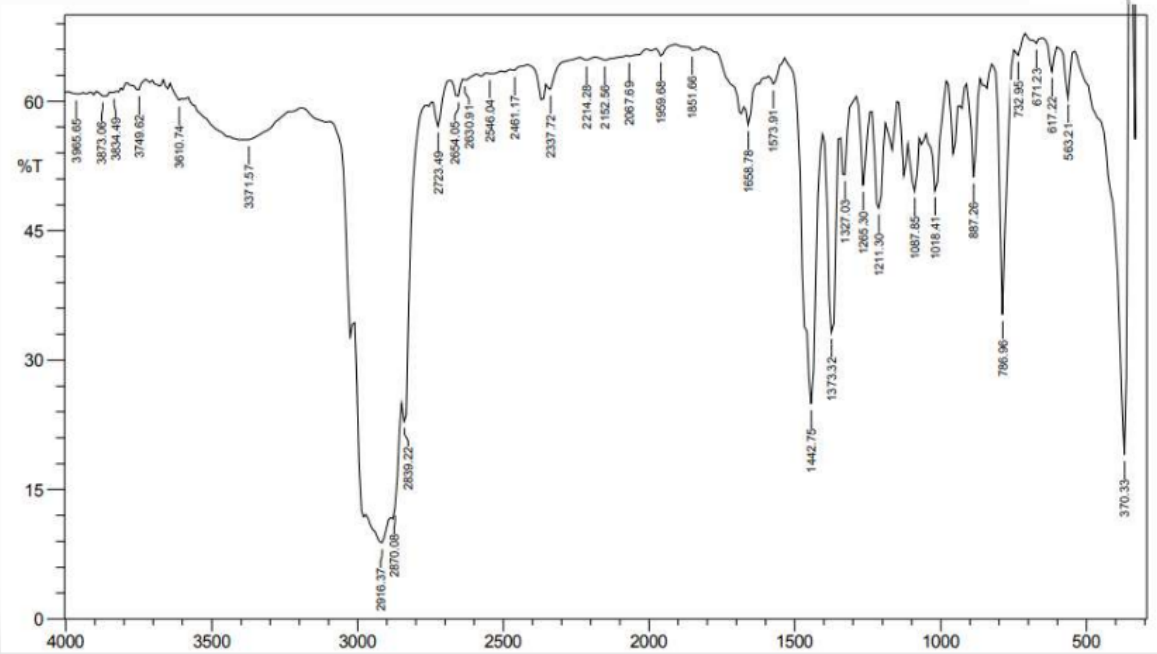


RESULT AND DISCUSSION

Alpha pinene as starting material



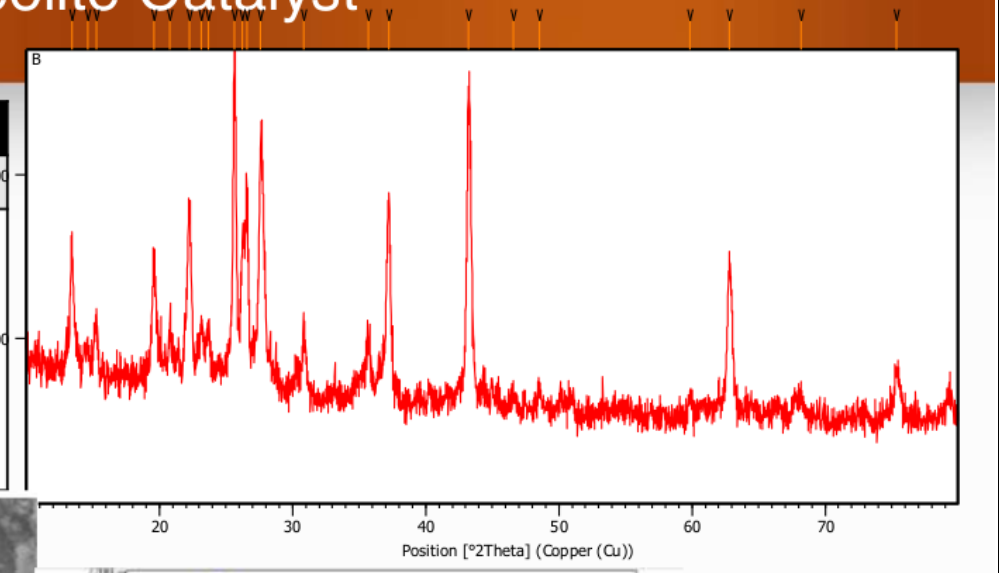


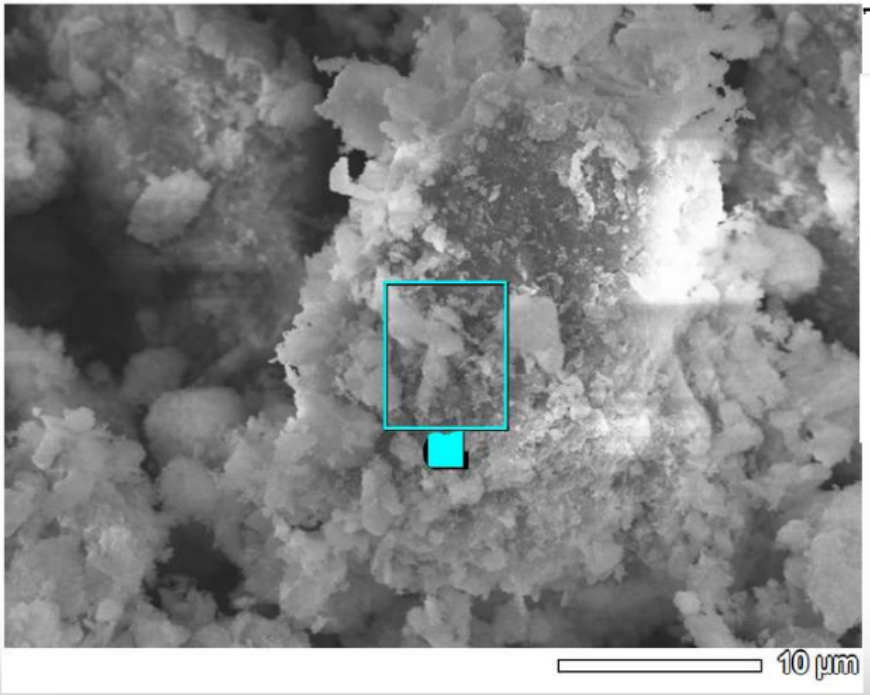


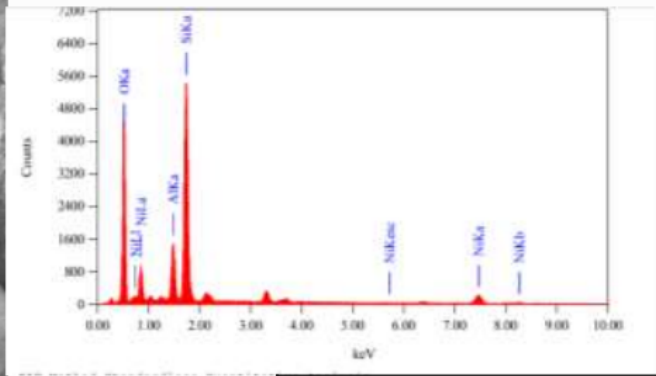
The levels of alpha-pinene in turpentine oil used as starting material is 93%

Charazterization of Ni/N-Zeolite Catalyst

	2θ	
	Standar	Ni/ZAA
Ni	35,840	35,6798
JCPDS No. 65-0380	37,80	37,2188
	50,146	42,2240
		62,7864

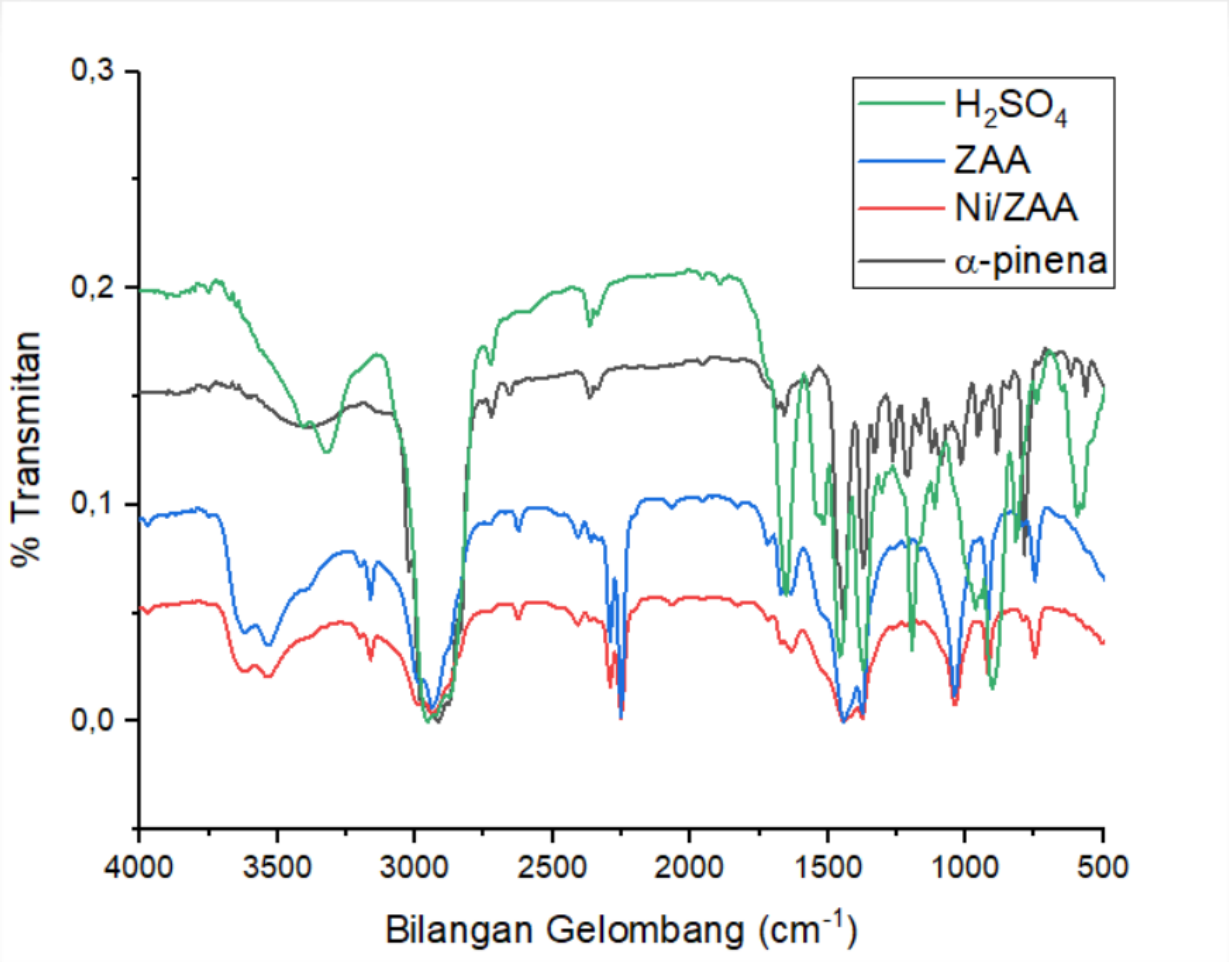




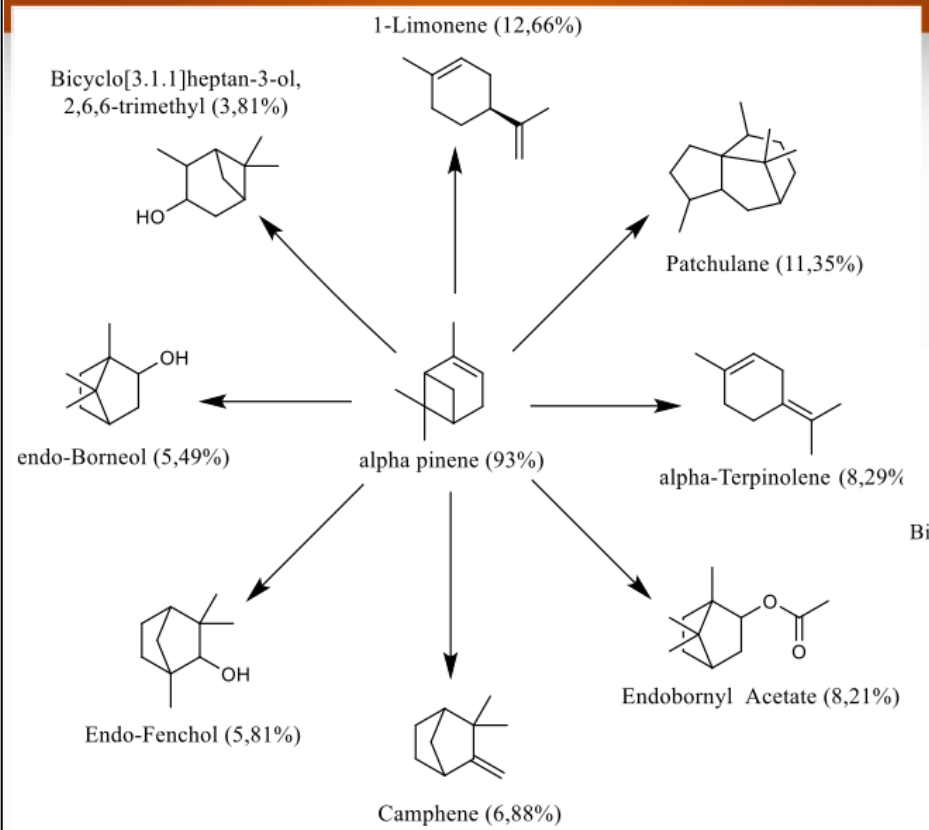


Elemen	Weight (%)
O	52,03
Al	6,87
Si	27,45
Ni	13,65
Total	100,0

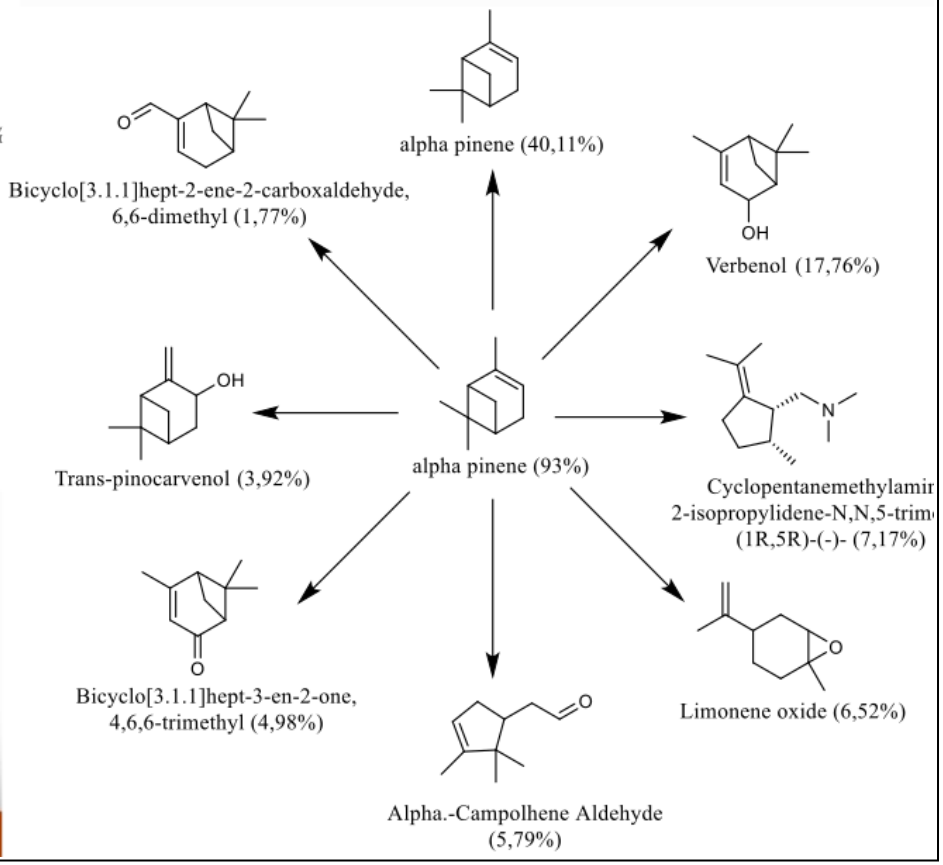
Charazterization of Reaction Product with FT-IR



Charazterization of Reaction Product with GC-MS

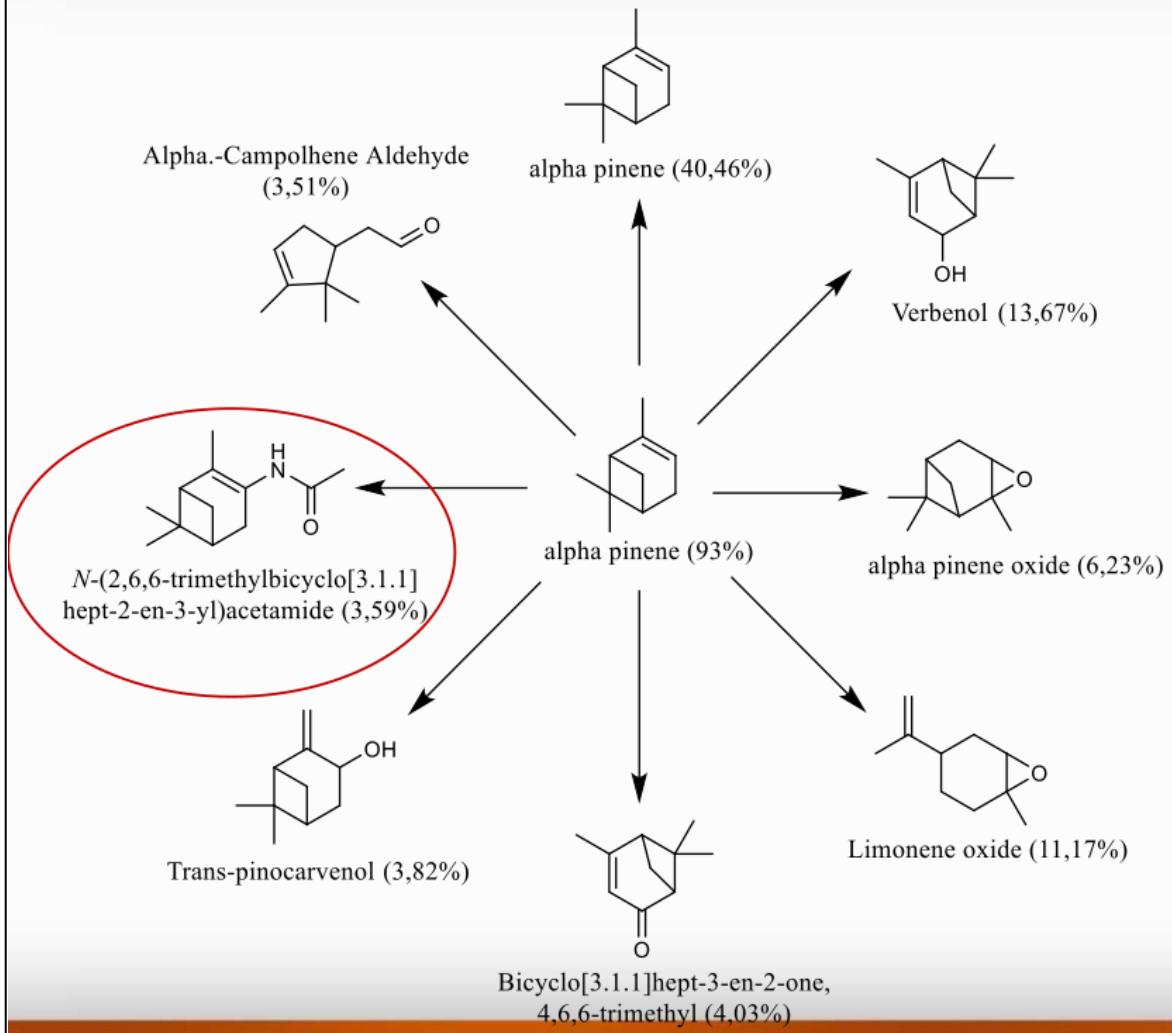


Reaction with sulfuric acid by ultrasonication at room temperature for 5 h



Reaction with natural zeolite catalyst by ultrasonication at room temperature for 5 h

Reaction with Ni/ZAA catalyst by ultrasonication at room temperature for 5 h



Conversion of alpha pinene = 54,56%

% yield of product = 4.1%

CONCLUSION

- Amide compounds are only formed in reaction products with a Ni/ZAA catalyst. Based on this, it can be concluded that the acidity of the catalyst affects the reaction products formed in the Ritter reaction. In addition, there is an effect of reaction time, in further research it is necessary to vary the reaction time using a Ni/Natural Zeolite catalyst

THANK YOU

Synthesis of Acetamide Compounds from α-Pinene through Sonochemical Ritter Reaction with Ni/Natural Zeolite Catalyst

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13