

# Microwave Induced Electrophilic Aromatic Substitution of Pyridines

Glenn Harris  
Appalachian State University  
Advisor: Dr. Nicole S. Bennett  
August 12, 2005



Appalachian  
STATE UNIVERSITY

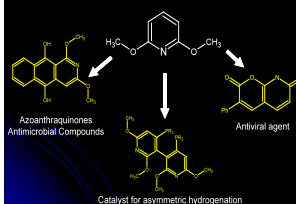
## Abstract

Testaferri *et al.* have reported the synthesis of the mono- and dimethoxy pyridines in DMSO, in 2 to 38h at 80°C using an excess of NaOMe. We have found that in the microwave 2-methoxypyridine can be prepared in only 5 minutes at 65°C (>95% conversion) and 2,6-dimethoxypyridine can also be prepared in good yield in less than an hour. We have extended the scope of this microwave-induced reaction by adding sterically larger groups (R = Pr, Bu, sec-Bu and phenyl) to 2,6-dibromopyridines with 64-95% conversion to the 2-alkoxypyridine in only 5 minutes.

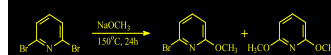
## Advantages of Microwave

- Faster reaction times.
- Undesirable side reactions are avoided.
- Quick results for research.
- Higher temperatures are reached in a shorter amount of time.

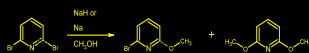
## Synthetic Uses of 2,6-Dimethoxypyridine



## How 2,6-Dialkoxypyridines are Normally Made



## Results



Conditions	Time	Temperature (°C)	Watts	Product 1 (%)	Product 2 (%)	Starting Material (%)
Microwave	5 min	65	10	75 (yield)	0	Trace
Microwave	10 min	65	10	>95	Trace	0
Microwave	5 min	90	20	>95	Trace	0
Microwave	25 min	90	20	>95	Trace	0
Microwave	60 min	120	20	61	39	0

## <sup>1</sup>HNMR After Preparative LC

