Synthesis of Phenobarbital, An anticonvulsant Drug

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ABSTRACT

This project studied the synthesis of phenobarbital which has a potential in the treatment of convulsion. There are eight methods for the synthesis of phenobarbital. In this research work, only two methods were investigated. The first method was based on the reaction of diethyl ethylphenylmalonate and urea in the presence of sodium ethoxide (by adding 1/2, 1/4, 1/8 and 1/8 portion of sodium ethoxide solution for first, second, third and fourth hour, respectively). The second method was based on the reaction of diethyl ethylphenylmalonate and urea in the presence of sodium methoxide. This method was divided into two categories. The first category; diethyl ethylphenylmalonate was added into sodium methoxide and then urea was added. For the second category; urea was added into sodium methoxide and finally diethyl ethylphenylmalonate was added. The synthesis of phenobarbital, using the second category, gave the highest percentage yield (17.45%). The synthesized phenobarbital was identified by using 3 techniques, thin layer chromatography, infrared spectrophotometer and melting point determination.

Key words: Phenobarbital, Synthesis

INTRODUCTION

Conventional antiepileptic drugs have been used for a long time. Their therapeutic uses and effectiveness are satisfactory. Their adverse effects are more well-known than the new antiepileptic drugs. Conventional antiepileptic drugs which are used currently are phenytoin, ethosuximide, carbamazepine, valproic acid and phenobarbital. (Andrejus, 1988 ; Nantachit, 2002) The objective of this project is to synthesize phenobarbital.

There are eight methods of synthesis of phenobarbital. (Daniel and Lester, 1977 ; Roth and Kleeman, 1988)

In the first method, phenylethylmalonic diethyl ester was reacted with urea in the medium of sodium ethoxide.