Synthesis of 1,4-dihydropiridine derivatives in microwave flow reactor

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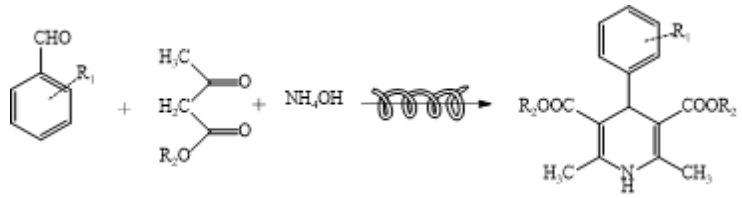
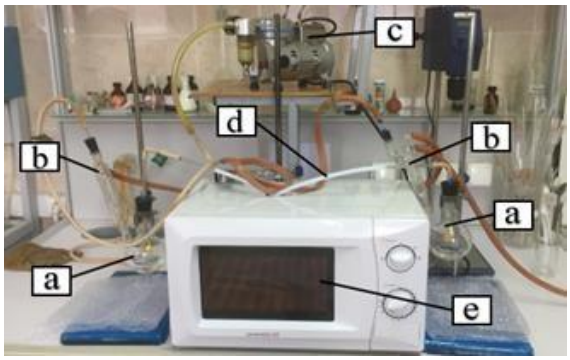
1,4-Dihydropyridine derivatives (e.g. Nimodipine, Nifedipine, Nitrendipine), which belong to the group of calcium channel blockers, serve as effective drugs in the treatment of cardiovascular diseases. According to the World Health Organization (WHO), this disease class ranks first in terms of the number of deaths worldwide. Considering the unfavorable statistics of mortality from cardiovascular diseases, which is about 17 million people per year, the development of unique, cost-effective methods of obtaining 1,4-dihydropyridine derivatives is an urgent task. The previously developed method for effective Nifedipine and Nitrendipine synthesis in a microwave bath reactor is only suitable for the synthesis of small amounts of the product since attempting synthesis in large amounts results in loss of microwave irradiation benefits. The implementation of the process in a microwave flow reactor is the key to solving this problem.



R_1 = H; 2-NO_2; 3-NO_2

R_2 = Me; iPr



a. Reservoirs;
b. Reverse refrigerators;
Pump;
d. *Reactor;*
e. *Energy source*

The use of a microwave flow reactor for the synthesis of 1,4-dihydropyridine derivatives is an effective method that not only increases the reaction rate but also enables its large-scale production.

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