METHOD OF GRAPHENE SYNTHESIS IN THE COMBINED FLAME

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Since the discovery of the first method of obtaining graphene by mechanical splitting of graphite layers, the efforts of many researcher have been aimed at developing more effective approaches to solving actual problem related to the development of a reproducible method for the synthesis of graphene in macroscopic amounts. The flame is an ideal reactor for the production of carbon nanomaterials by the method of assembling them using a bottom-up mechanism, since in the flame, the formation of the final product occurs through successive elementary acts consisting of innumerable of chemical reactions that occur in a very short period of time. At present, the only problem remains the solution of the problem of controlling the reaction route of chemical reactions for the formation of desired combustion products. In the proposed study, a method for the selective use of intermediate combustion products as a building material for the formation of graphene has been developed to solve this problem. The main novelty of this research is to the use of the phenomenon combining of the reaction zones of flames during the combined combustion of different fuels. This allows you to influence the structure and property of the resulting final products of combustion, by changing the composition of intermediate particles in the reaction zone of the combined flame acting as building materials. The main advantages of the proposed method are the synthesis of graphenes in an open atmosphere, the short time of the graphene formation process and the absence of additional energy costs.