

Rancang Bangun Reaktor Mini Berbasis Gelombang Ultrasonik untuk Produksi Graphene sebagai Bahan Dasar Elektroda Transparan

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ABSTRACT

Ultrasonic Wave-Based Mini Reactor Design for Graphene Production as a Transparent Electrode Base Material

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Activities focused on two activities, namely: (1) Realization of an ultrasonic wave-based LPE reactor that can be varied in power, time and reaction temperature. (2) The optimization process for the synthesis of graphene material from graphite powder using a ready-made LPE reactor. The realization of the ultrasonication tool which can be varied with several parameters (power, time, and temperature) has been successfully carried out even though it involves a third party in the procurement. This is due to the Covid-19 pandemic, which limits the working time of tools in the laboratory. Nevertheless, the research team succeeded in conducting research on the production of nanomaterials and multi-layered graphene using the ultrasonicator. The results of research on the production of nanomaterials in the form of nanoemulsions have been held in seminars and published at the 2021 ICRIEMS International Conference (International Conference of Research Implementation on Education Mathematics and Sciences 2021). The result of the next research is the study of the effect of ultrasonication power and time parameters on the efficiency of graphene production from graphite powder. From this study it was found that high power equivalent to 300 W can be used to remove streaks in a short time, 10 minutes while for low power equivalent to 50 W it can be used to peel off in 240 minutes. In addition, a study of the effect of initial treatment on graphite before the ultrasonication process was also carried out in this study. The result is that the treatment of microwave radiation makes it easier for graffiti to be peeled off using the ultrasonication method. This result is being planned to be tested.

In the future, research on the effect of graffiti concentration on peeling time needs to be done to get a more comprehensive picture of this ultrasonic peeling method. In addition, research on the morphology and quality of the resulting graphene still needs to be done.

Kata Kunci: *liquid phase peeling, ultrasonic waves, graphene*