Mass Production and Advanced Application of Graphene Flower® and Related Products

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Incubation Alliance, Inc., since its establishment in 2007, has been dedicated to developing a method for mass synthesis of graphene. In 2009, we successfully pioneered a technique for producing few-layer, flower-shaped graphene, which we call Graphene Flower®, without the need for substrates or catalysts.[1)] In 2010, we became the first company in the world to commercially sell graphene dispersions for research and development, and we actively pursued research into the practical applications of graphene.[2)] Our commercially available graphene and graphene-related products include: (1) bulk materials and dispersions of Graphene Flower®, (2) Graphene Flower® Cloth - a self-supporting few-layer graphene structure grown on the surface of carbon fibers,[3)] and (3) Graphene Flower® Block – a large, molded graphene structure with performance comparable to that of HOPG,[4)] and (4) cold neutron reflector materials – graphene structures engineered with precise three-dimensional control at the nanoscale.[5)-7)] We are actively exploring applications of Graphene Flower® Cloth as electrode materials for field emission devices, biofuel cells, supercapacitors, and fuel cells; and applications of Graphene Flower® Block as heat dissipation materials in medical equipment, IT equipment, and next-generation energy furnaces. We will also discuss recent developments on graphene as neutron reflectors that can enhance neutron intensity below cold neutrons and its potential in advanced scientific applications.

References

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[3] K. Muramatsu, Graphene2015 International Conference and Exhibition, Bilbao-Spain.
[4] K. Muramatsu. U.S. Patent US11339055B2, May 24, 2022.
[5] K. Muramatsu, et al., Patent pending, PCT/JP2022/024712.
[6] M. Teshigawara, et al., Nanomaterials, 13 (2023) 76.
[7] M. Teshigawara, et al., Journal of Neutron Research 26 (2024) 69-74.

Figures

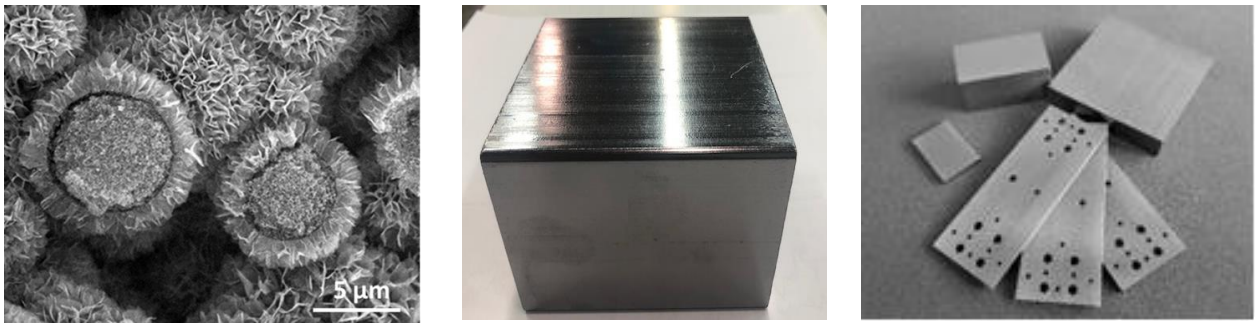

Figure 1: Graphene Flower®, Graphene Flower® Block and heat dissipation products