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Development of Thermal Plasma Application Carbon Material Using Anthracite

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Recently, the issue of internalization of carbon materials in response to the movement toward strategic materials for carbon materials, which are emerging as core materials for cutting-edge future industries, is greatly emerging. Gangwon-State, which has the largest coal deposits in Republic of Korea, has been driving the country's industrial development, but due to the coal industry rationalization policy, almost all coal mines have been shut out and abandoned since 1989.

Application of nanotechnology is required for innovation in future high-tech industries, and in the case of anthracite, there is a demand for conversion to high value-added materials such as artificial graphite and graphene for application in this high-tech industry.

In order to revitalize Gangwon-State's anthracite industry, which is being abandoned under the pretext of lack of economic feasibility, it is urgently necessary to transform it into a high value-added material in addition to its application as a raw material used in the current traditional industry.

In this study, we conducted to internalize resources by converting anthracite coal refined by flotation separation into carbon materials using thermal plasma method. First, raw materials with an ash content of about 30% were refined into high-quality refined anthracite coal with an ash content of about 5% through the flotation separation process. Through this, the uniformly refined anthracite coal was manufactured into graphite using dry plasma method, and the degree of graphitization was analyzed using XRD. The developed graphite showed 97% graphitization, and major impurities (Fe, Si, etc.) showed a decreasing trend.

Biography:

Ph.D Yong-Hyun Lee is currently as the regional industry innovation promotion team General Manager at Yeongwol industrial promotion agency. He is currently working on a project to build a value chain innovation platform for anthracite-based carbon nanomaterials and parts industry. His research interests are the development of materials using minerals and ceramic. And he has carried out various national R&D projects, including the development of functional ceramic materials through mineral refinement and the development of piezoelectric materials for sensors.