

New type of carbon nano-particles made from PAN-based precursors

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We have reported the new type of carbon nano-particles prepared from polyacrylonitrile(PAN)-based precursors in our novel method [1]. These carbon particles, which are named “Carbon Nanopod^{o,R}”, have unique structure of spindle or sphere shape with a hollow inside, and exist one by one. Especially, they are of uniform shape and size, since they are given by carbonizing polymer particles which are also of uniform ones. Therefore, they have good dispersibility into some polar medium without their own agglomeration or entanglement. Here, we will report their property and potentiality for some applications, such as using them in aqueous system, which have been investigated based on their feature.

In our method, we used uniformly sized nano-particles of poly(acrylonitrile-co- methylacrylate) as precursors, which were prepared by conventional emulsion polymerization. After converted to some desired shape by mechanical process, they were carbonized to obtain the nano-particles. We also found, when sphere shape of particles required, carbonization of the emulsion particles coated with heat resistant material gave whole sphere particles of carbon of similar size. By using this method, one polymer nano-particle can be converted to one carbon nano-particles of desired shape and structure in extremely high selectivity.

It's expected for this material to be developed into the practical use, and also for this unique process to provide some carbon materials corresponding to their each application just like custom-made preparation.

- [1] M.Yamamoto, H. Aikyou, T. Shiroya *Fullerene, Nanotubes, and Carbon Nanostructures* **14**, 467-472 (2006).