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Effect of mixing alcohol source on synthesis of nanographene by in-liquid plasma HIROKI KONDO, ATSUSHI ANDO, TAKAYOSHI TSUTSUMI, Nagoya University, KEIGO TAKEDA, TAKAYUKI OHTA, Meijo University, KENJI ISHIKAWA, MAKOTO SEKINE, Nagoya University, MASAFUMI ITO, MINEO HIRAMATSU, Meijo University, MASARU HORI, Nagoya University
— High speed synthesis of nanographene materials with high crystallinity can be realized by in-liquid plasma using alcohol sources. In this method, there is a trade-off relationship between synthesis rate and crystallinity depending on molecular-weights of alcohol sources. This is attributed to etching effects of carbon by oxygen or hydroxy species generated from alcohols. In this study, effect of mixing alcohol and hydrocarbon sources on synthesis of nanographene by in-liquid plasma was investigated. The methanol added 1-butanol or n-hexane were used as source liquid. When only the methanol was used, nanographene was hardly synthesized. This also indicated etching effects of carbon by oxygen or hydroxy species. Depending on mixing ratios of methanol to 1-butanol or n-hexane, a trade-off relationship between synthesis rate and crystallinity was found as well as the cases using pure alcohol sources. However, even when different pure and mixture sources with same composition ratio of carbon (C) to oxygen (O) were used, synthesis amount and crystallinity were not same. This result means that they are not determined only by the C/O ratio. The decomposition process of the raw material itself and the generated precursors could further contribute the synthesis rate and crystallinity.

Hiroki Kondo
Nagoya University

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