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One-step synthesis of N-doped graphene in a plasma jet reactor

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Abstract

© Published under licence by IOP Publishing Ltd. The possibility of doping graphene during its synthesis in a plasma jet of nitrogen has been studied. Direct current plasma torch with power of up to 40 kW was used as plasma jet generator. The source of carbon was propane-butane mixture, acetylene or methane. Synthesized materials are characterized by scanning electron microscopy, X-ray photoelectron spectroscopy and thermogravimetric analysis. It has been shown that XPS spectra of graphene flakes produced in nitrogen plasma differ in atomic nitrogen content. The maximum degree of nitrogen doping of graphene was obtained at decomposition of acetylene at 77 Torr.

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