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Synthesis of Copper and Nickel Nanoparticles from a Plasma Discharge in Liquid JINYOUNG HUH, SUKHWAL MA, KANGIL KIM, YONG CHEOL HONG, National Fusion Research Institute, NATIONAL FUSION RESEARCH INSTITUTE TEAM, KWANGWOON UNIVERSITY TEAM, CHONBUK NATIONAL UNIVERSITY TEAM, NPAC TEAM — Nanoscale metal particles have been attracting much attention because of their unique size- and dimensionality dependent physical and chemical properties. In order to fabricate metal nano-particles, many methods are ported such as chemical vapor deposition, thermal decomposition, micro-emulsion, UV-irradiation, the polyol process, and so on. However, previous methods may cause secondary environment pollution. Moreover, most of the synthetic methods are not economically feasible due to low throughput and poor scalability. In this work, we propose the synthesis methods of metal nano-particles by underwater discharge to overcome the shortcomings of reported methods. The copper and nickel nano-particles are synthesized by underwater discharge, and they have the diameter less than 100 nm. Also, we confirmed Cu and Ni nanoparticles were not oxidized through XRD analysis. We expect that the metal nano-particles synthesized by underwater discharge can be applied to electronic industry such as printed electronics and multi-layer ceramic capacitors (MLCCs).

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