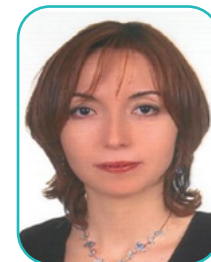


Chemical Vapor Deposition Growth of MXenes; Mo₂C

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Abstract

MXenes have emerged as a novel and attention-grabbing member of two-dimensional (2D) material family thanks to their outstanding stability and metallic features. However, it is very challenging to produce large area and uniform 2D MXenes. Herein, we aim to grow controllable, large-area, high quality 2D Mo₂C crystals to be utilized as ideal contacts and electrodes by using chemical vapor deposition method. In this specific work, by changing the flow rates of the carrier gases including H₂ and N₂, we attempt to increase the substrate coverage and flake sizes of 2D Mo₂C crystals. When we use only H₂ gas we obtained hexagonal and triangular shaped crystals, although the substrate surface was not fully covered. When we introduced the N₂ gas to the system, this increased the coverage, however, it also caused the thickness to increase. Regular shaped flakes could be beneficial to be used as contacts in transistors, however, large coverage is required for supercapacitors. This study could provide an insight to obtain high surface coverage with well-shaped crystals.

Biography

Nihan Kosku Perkgöz received the B.Sc. degree in electrical and electronics engineering from Middle East Technical University, Ankara, Turkey, in 1999, and the M.Sc. and Ph.D. degrees in semiconductor electronics and integrated science from Hiroshima University, Hiroshima, Japan, in 2003 and 2005, respectively. From 2007 to 2012, she was as the Projects Coordinator at Nanotechnology Research Centre and Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, Turkey. From 2012 to 2018, she was a Faculty Member with the Department of Electrical and Electronics Engineering, Anadolu University, Eskişehir, Turkey. Since 2018, she has been a Faculty Member with the Department of Electrical and Electronics Engineering, Eskişehir Technical University, Eskişehir, Turkey. Her research interests include 2-D-based materials and optoelectronic devices.



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