

## Study of the possibility of using an alternating current plasma torch to obtain ultrafine tungsten carbide

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Received 1.06.2023; accepted 27.06.2023

*The paper deals with the features of the plasma-chemical process for obtaining tungsten carbide using an alternating current plasma torch, the synthesis was carried out in hydrogen and methane plasma. The process of obtaining tungsten carbide is as follows: WO<sub>3</sub> tungsten oxide powder is exposed to H<sub>2</sub> and CH<sub>4</sub> plasma flow with a maximum temperature of up to 10000 K. The gas mixture flow rate was up to 0.02 g/s, the plasma torch power was up to 3 kW in most of experiments. The obtained samples were studied by X-ray diffraction, scanning electron microscopy and elemental mapping using energy-dispersive x-ray spectroscopy. It was found that during the synthesis tungsten carbide WC was obtained, its dimensions are in the range of 5–20 microns.*

**Keywords:** plasma torch, alternating current, hydrogen, methane, tungsten carbide, plasma-chemical synthesis.

DOI: 10.51368/1996-0948-2023-5-103-109

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