

INFLUENCE OF AL CONTENT ON PROPERTIES OF CoCrFeNiAl_x HIGH-ENTROPY ALLOYS PREPARED BY MECHANICAL ALLOYING AND SPARK PLASMA SINTERING

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High-entropy alloys (HEA) belong to a new type of metal alloys that consist of 5 or more elements with a content of 5 – 35 at.% that are usually prepared by different techniques including more or less traditional ones. One of the more advanced is mechanical alloying combined with subsequential spark plasma sintering (SPS). Due to the high number of elements and the high mixing entropy, the formation of disordered solid solutions occurs at the expense of the formation of intermetallic phases in the HEA structure. These alloys are characterized by exceptional mechanical properties while maintaining plasticity. The work aimed to determine the effect of Al content in the CoCrFeNiAl_x alloy ($x = 10, 20, 30$ at.%) on microstructure and resulting mechanical properties. It was found that the best mechanical properties were achieved in the case of an alloy containing 20 at.% Al.

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