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WC-TiC-TaC-Co 초경합금의 미세조직 및 기계적성질

Microstructure and Mechanical Properties of WC-TiC-TaC-Co Cemented Carbides

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Cemented carbides, consisting of WC grains bound by the Co phase, have been used as cutting tools, rock drill tips and other wear resistant components for decades. They are fabricated from carbide and metal powders by liquid phase sintering at approximately 1300-1500℃. Plain WC-Co was invented in 1923 and was, for a long time, the dominating type. Addition of TiC and other cubic carbides e.g. TaC, TaC, NbC, HfC, etc., were later made to WC-Co to improve its steel cutting performance. The transition metal carbides TiC are used as high temperature structural and wear resistant materials because of their interesting physical and chemical properties. WC-Co with the addition of TiC is a very important, mainly used for metal cutting tools. WC-TiC-Co cemented carbides which have better hardness and wear resistance than WC-Co cemented carbides have been introduced to improve the mechanical performance for wider applications of cemented carbides [1-3]. The advantageous effect of TaC on cermets has also been reported that tantalum increased the plastic deformation resistance during metal cutting [4]. However, few researches on the microstructure and mechanical properties of WC-TiC-TaC-Co cemented carbides have been carried out. In this study, in order to investigate the effect of TiC and TaC addition in WC-Co cemented carbides, the relationship between microstructure and mechanical properties of WC-TiC-TaC-Co cemented carbides were analyzed.

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