

## TiAlCrSiN 박막의 고온 산화 부식 High-temperature Oxidation of the TiAlCrSiN Film

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**초 록 :** TiAlCrSiN films were developed in order to improve the high-temperature oxidation resistance, corrosion resistance, and mechanical properties of conventional TiN films that are widely used as hard films to protect and increase the lifetime and performance of cutting tools or die molds. In this study, a nano-multilayered TiAlCrSiN film was deposited by cathodic arc plasma deposition. It displayed relatively good oxidation resistance at 700-900°C, owing to the formation protective oxides of Al<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>, and SiO<sub>2</sub>, and semiprotective TiO<sub>2</sub>. At 1000°C, the increased temperature led to the formation of the imperfect oxide scale that consisted primarily of the outer (TiO<sub>2</sub>,Al<sub>2</sub>O<sub>3</sub>)-mixed scale and inner (TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>)-mixed scale.

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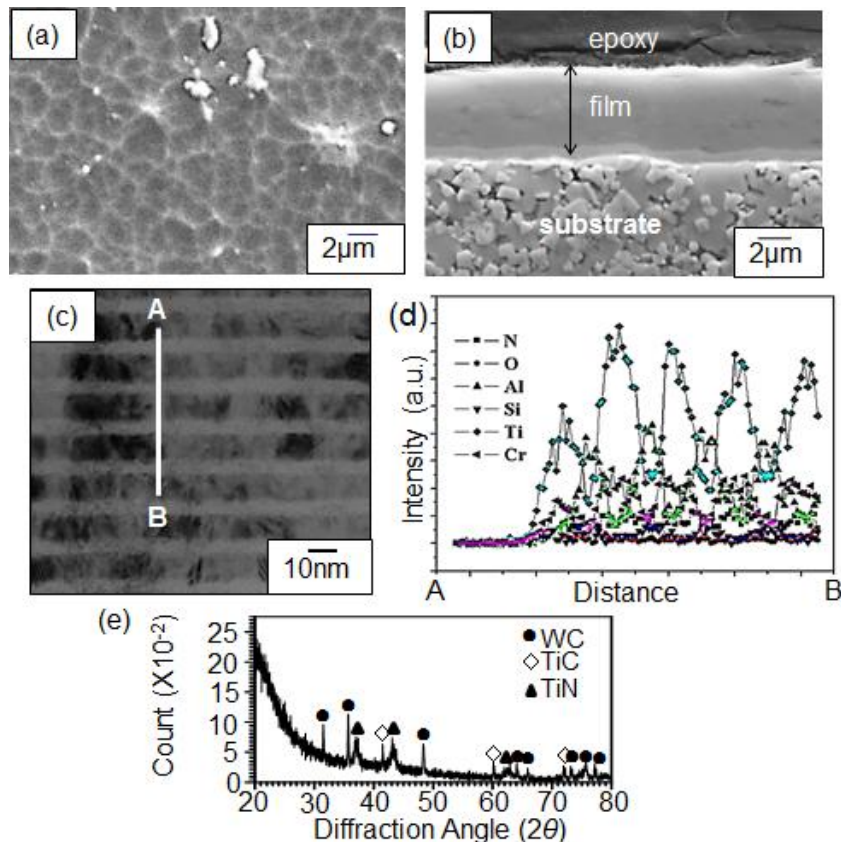


Fig. 1. TiAlCrSiN film deposited on the WC-20%TiC-10%Co substrate. (a) SEM top view, (b) SEM cross-sectional image, (c) TEM cross-sectional image. (d) EDS line profiles along A-B. (e) XRD pattern.