

## Evaluation of Solid Surface Properties by Analysis of Liquid Penetration Rate into Powder Beds

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Evaluation of solid surface properties by analysis of liquid penetration rate into powder beds is very important for application of powder products. The penetration rate was related the surface property in powder beds. So, the contact angle values for several powders to analysis surface property of powder were obtained by Washburn equation and Wicking method. The surface free energy value  $\gamma_S$  was divided into the polar component,  $\gamma_{Sp}$ , and the dispersion component,  $\gamma_{Sd}$ . The inorganic powder such as calcite were used as test samples. The effect of particle size and the kinds of experimental liquid were obtained on penetration rate. It was confirmed that the surface free energy of grinding sample decreased than the classification sample.

**Keywords:** wettability, contact angle, surface free energy, Washburn equation, wicking

## 첨가원소 Sn의 증가에 따른 Ti-Fe-Sn 극미세합금의 미세조직 및 기계적 성질 변화

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In the present study, microstructural evolution and mechanical properties of Ti-Fe-Sn ultrafine eutectic alloys have been investigated. Ultrafine eutectic microstructure consisting of a mixture of  $\beta$ -Ti solid solution and FeTi intermetallic compound homogeneously formed in  $Ti_{70.5}Fe_{29.5}$ ,  $Ti_{69.8}Fe_{29.8}Sn_1$  and  $Ti_{68.4}Fe_{28.6}Sn_3$  alloys. Addition of Sn in the  $Ti_{70.5}Fe_{29.5}$  eutectic alloy induced volume fraction change of FeTi phase. In addition lattice parameter of  $\beta$ -Ti phase changed due to increasing Sn content. Addition of Sn 3 at.% induced morphology change of the eutectic colony into spherical shape and decreasing of colony size. Refining of microstructure reveal that development of mechanical properties, With increasing the content of Sn in these alloys, it is effective to enhance the macroscopic plasticity up to 4.7 %.

**Keywords:** Ti, 공정합금, 미세조직, 전단파