

AFM을 이용한 액상내 시료 측정시 분해능 개선 연구

김영훈*, 이종협¹

광운대학교 화학공학과; ¹서울대학교 화학생물공학부

(korea1@kw.ac.kr*)

The open liquid-cell atomic force microscope (AFM) has potential for studies of biomaterials and surface morphology in liquid media, and a variety of fluids can be used as buffer solutions. The dependence of image distortion on fluid properties (kinematic viscosity) has been studied with edge friction force obtained in lateral images. Previous studies indicate that the scan rate should be slower for obtaining a non-distorted image. However, the time required for the scan is greatly increased. Therefore, we introduced the vector concept to evaluate the net force for scanning in the y-direction, and found two solutions to achieve a zero force difference introduced by the cantilever-fluid and the tip-surface. When the scan rate approaches zero or a specific velocity (30 $\mu\text{m/s}$ in this study), the force of the interaction induced by the cantilever-fluid and tip-surface is reduced to a considerable extent. Among the two solutions, a scan with a specific velocity is an easy, rapid method for obtaining a non-distorted image, compared to the previously proposed method (scan rate approaches zero). This proposed model was confirmed in a proof-of-concept test using 2-propanol.