

In-Situ Measurement of Crystallization and Phase Transformation of Sulfamerazine using Quartz Crystal Microbalance

Liu Lishang, 김우식*
경희대학교
(wskim@khu.ac.kr*)

A sensitive and simple sensing technique using Quartz Crystal Microbalance (QCM) is successfully developed for in-situ monitoring crystallization and phase transformation process of SMZ (sulfamerazine) in the solution. In cooling crystallization of sulfamerazine, decreasing the temperature leads to the increase of the solution viscosity, causing the slight increase of resonant resistance in the quartz vibration. Simultaneously, it reduces the resonant frequency before the crystallization is induced. Then, when the crystallization occurs, the sudden and significant change of resonant resistance and frequency in the quartz vibration appear due to the viscosity change of the suspension and the mass loading of the crystals on the sensor. Also, the phase transformation of sulfamerazine is reflected by the resonant frequency decrease and resonant resistance increase. That is, the frequency decreased due to the mass loading of crystals on the sensor surface. The resistance increased due to the viscosity increase of the suspension. The QCM monitoring of the crystallization and phase transformation is consistently confirmed by off-line measurement using SEM and Raman spectroscopy.