

Effect of wet/dry transition on the atmospheric corrosion of Zn
아연의 대기부식에 미치는 주기적 침적/건조 효과

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The atmospheric corrosion properties of Zinc (Zn) under wet/dry transition of H₂O film were investigated in this study. The atmospheric corrosion of metal is usually occurred as a result of repetitious thickness transition (so called wet/dry transition) of liquid phase which is covering the metal surface. Corrosion potential and the polarization behaviour of Zn during liquid film thickness transition were measured by Kelvin probe method which is using vibrating reference electrode without touching the liquid film. The oxidized states of Zn as a result of successive wet/dry transition were also investigated by X-ray diffraction (XRD) and X-ray photoelectron spectroscopy (XPS). The results show that the corrosion potential and the corrosion rate of Zn both are increasing during drying. However, the corrosion rate is decreasing again when the Zn surface is completely dried while the corrosion potential still remains high. This behaviour can be explained by the polarization behaviour change of Zn according to the H₂O film thickness change. The completely dried surface is consisted mostly with Zn and ZnO phases. After a number of cycles of wet/dry transition, however, the oxidized Zn phase of ϵ -Zn(OH)₂, which has rather voluminous and defected structure, were found.