In-situ monitoring of pitting corrosion of copper alloys by holographic interferometry

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Abstract:
Early stages of pitting corrosion of pure copper and an aluminium–brass alloy in tap water were monitored in situ by the optical corrosion-meter during the cyclic polarization test. The observations of pitting corrosion were basically interferometric perturbations detected only on the surface of the pure copper in tap water. The interferometric perturbations are interpreted as a localized corrosion in the form of early pittings, of a depth ranging between 0.3 micrometer to several micrometers. Results of the present work indicate that holographic interferometry is a useful technique as a 3D-interferometric microscope for monitoring pitting at the initiation stage of the phenomenon for different metallic samples in aqueous solutions.

Keywords: Other Methods, general corrosion; pitting corrosion; copper; aluminium–brass alloy; holographic interferometry; cyclic polarization test; tap water.