

Study on Stress Corrosion of Unearthed Plate Iron Relics in Nantong

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Abstract Plate iron is an ancient salt making tool, and also is a typical representative of large-scale iron cultural relics. The plate iron unearthed in Nantong has severe corrosion diseases. For such relics, the stress corrosion caused by self-weight and the surroundings is catastrophic. In this work, the corrosion products of seven unearthed plate iron relics in Nantong were analyzed, including composition, structure and morphology. Fem simulative analysis was also conducted based on 3D scanning and display form. The corrosion property and reasons for plate iron relics under multiple factors were comprehensively discussed, in order to provide useful references for the scientific protection and preservation of such cultural relics.

In short, the studies show that stress corrosion is one of the most harmful forms of corrosion for large iron cultural relics. Once it exists, it is necessary to strengthen prevention and take timely protective measures. From a mechanical perspective, it is necessary to eliminate or reduce stress by selecting large areas or multiple points that are parallel or nearly parallel to the horizontal plane and symmetrical about the center of gravity for support; From the perspective of the medium, a low humidity or oxygen free environment is the best solution; From the perspective of cultural relics, corrosion inhibition and sealing treatment should be carried out while dechlorination, removal or transformation of unstable rust, in order to improve their ability to resist the environment.

Keywords plate iron, large-scale iron cultural relics, corrosion product, Fem simulative analysis, stress corrosion

Reference

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