The Behaviour of Tribocorrosion on EH47 High-Strength Ship Hull Steel in a 3.5% NaCl Solution

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In this paper, the tribocorrosion behaviour of EH 47 high-strength ship hull steel in a 3.5% NaCl solution was investigated. The tribological and corrosion tests were carried out on a Si₃N₄ ball-on-EH47 high-strength ship hull steel disc tribometer under different sliding time conditions. The disks were continuously immersed in sandy 3.5% NaCl solution during the whole process of the tribological tests. After the tribological tests, electrochemical tests were carried out to obtain typical polarization curves and electrochemical impedance spectroscopy diagrams. The corrosion experiments were performed to investigate the effect of abrasion on corrosion behaviour by immersing the samples in a container with 3.5% NaCl solution and 5 wt.% silica sand at room temperature for 7, 14, and 49 days. The micrographs, compositions and corrosion products of the worn scars were evaluated by scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) microanalyses.

Keywords: Corrosion; Abrasion; Marine environment; Wear mechanism; Tribological tests

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