Effect of Hydrogen on Cavitation Erosion Behaviour of High Strength Steel

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The cavitation erosion behaviors of high strength steel electrochemically charged with hydrogen in distilled water and 3.5% NaCl solution were investigated. The results showed the surface hardness of the steel increased by electrochemical hydrogen-charging but no noticeable effect on the \( E_{corr} \) under condition of quiescence and cavitation respectively. Under condition of cavitation the corrosion rate was enhanced, especially for specimen electrochemically charged with hydrogen at 50 mA·cm\(^{-2}\) for 12 hours. The mass loss increased with the increasing of current density of electrochemical hydrogen-charging. The corrosion induced by erosion played an important role in the synergistic effect under condition of cavitation and electrochemistry was confirmed that hydrogen embrittlement had a great influence on cavitation erosion of high strength steel.

**Keywords:** A. Low alloy steel, B. Erosion, C. Hydrogen embrittlement, D. Hardening

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