Short Communication

Influence of alternating current on corrosion behavior of X100 steel in Golmud soil simulated solution with different pH

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The alternating current (AC) corrosion behavior of X100 steel was studied in Golmud soil simulated solution with different pH using electrochemical measurement, immersion test and surface analysis technology. The results show that AC interference and pH can collectively affect the corrosion behavior of the steel. The applied AC weakens the oxygen depolarization, enhances the hydrogen evolution reaction, and promotes the corrosion of the steel. The corrosion form of the steel evolves from non-uniform general corrosion to localized corrosion as i_{AC} increases. Under the same interference of i_{AC} , the corrosion rate of the steel first decreases and then increases with increasing the pH value. The difference in the characteristics of corrosion products can affect the corrosion resistance of the steel to a certain extent. When AC is applied, a great number of cracks existing in the corrosion products of sample under the condition of pH=7 result in the severe corrosion. In contrast, the compactness corrosion product is conducive to protect the steel substrate tested at pH of 9.

Keywords: Corrosion behavior; AC interference; X100; pH

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