

Process water inhibition method for hydraulic testing

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Abstract

Since any hydro-testing is closely related to storage of the tested metal products, the first stage of any hydro-testing is to clean the inner surface of the metal product from either preservative or corrosion products that appeared during storage. Nowadays, we widely use polymers and polymer-based materials for cleaning metals and alloys surfaces of corrosion products. Such agents must satisfy the following requirements: firstly, firmly bind pollution and oxidized forms of metals, preventing surface passivation; secondly, be easily removed from the surface after cleaning; thirdly, components of the cleaning composition should not cause surface oxidation. However, these cleaning methods may not be suitable for hydro-testing due to possible formation of highly toxic waste water, so we often use methods of simultaneous washing with safer soda and citric acid under high pressure, followed by purging with dry air.

The paper studies aqueous solutions of N-M-1 corrosion inhibitor mixed with alkali as a corrosion suppressing method in hydraulic tests before commissioning of any product pipelines in order to reduce concentration of a toxic inhibitor in inhibited water. The experiment had two focuses: to assess effectiveness of a new mixture in terms of corrosion inhibition during product pipelines commissioning and to assess toxicity of the mixture using an acid test on two testing objects from two different systematic groups. We proved that, without losing its corrosion inhibition effectiveness in hydro-testing, the mixture can be safely dumped in sewer systems, being preliminarily acidified to acceptable pH values, thanks to lowered N-M-1 concentration. Apart from that, we identified a synergistic effect of N-M-1 corrosion inhibitor acting with NaOH alkali.

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