A study of using allium cepa (onion) as natural corrosion inhibitor in industrial chill wastewater system

Abstract

One major problem that is constantly associated with the industrial chill wastewater system is corrosion. As water is an integral part of this system, corrosion among the piping is inevitable. Corrosion tends to disintegrate the piping substance making it fragile and easy to rupture. The disintegrated parts of the piping could block the system and cause a decline in pressure and contributes to water pollution. Essentially, industries use inhibitor to retard corrosion and generally there are toxic and exhibit carcinogenic properties. However, these vital inhibitors are still being used in a small quantity due to lack of safe, natural based corrosion inhibitor. Accordingly, the current study describes the potential of using Allium cepa (Onion) as a natural corrosion inhibitor. The effectiveness of using Allium cepa was characterized in terms of metal weight loss, inhibitory efficiency, corrosion rate, area affected, turbidity and pH. Results showed that the optimum inhibition efficiency (IE) for iron, nickel and copper were 92%, 88% and 46%, respectively when Allium cepa was present at 0.6 g/L. In addition, the reduction in weight loss for iron, nickel and copper were 92%, 88% and 46%, respectively, demonstrating Allium cepa as an effective corrosion inhibitor, primarily for iron.