

**Abstract:** Corrosion of cast-iron or steel water pipes is a highly complex process influenced by a diversity of physical, chemical and biological parameters specific to a given water-pipe network. Corrosion processes in the underground and on-ground infrastructure of a drinking water distribution system not only incur substantial costs, but also deteriorate the quality of the water transported to the user. The authors of this paper not only present a critical state-of-the-art review of the published literature on corrosion phenomena in drinking water distribution systems, but also evaluate some historical analyses of this subject. In the paper, attention has been focused on the mechanism governing the corrosion process, on the concomitant reactions, as well as on the composition of the corrosion products being formed. This includes the composition and crystal structure of the corrosion deposits, and the composition of steady water in the tubercles, which is concomitant with the occurrence of solid corrosion products. Steady water is characterized by a surprisingly rich diversity of components, where the concentrations of organic and inorganic compounds many times exceed the values measured in drinking water. Consideration has also been given to the impact of water quality on the development of corrosion processes in water-pipe networks. Much of the quality deterioration comes from the interactions between the water components and the corrosion products accumulating on the inner pipe walls. Other major issues considered in the review paper include the release of iron and sulfides, the migration of chemical elements from the corroding materials into the water, and the degradation of disinfection by-products. In conclusion, the complexity of the corrosion process, its dependence on the quality of the water being transported, as well as the poor material condition of the water-pipe networks (pipe service age effect) suggest that controlling corrosion in water-pipe networks will still be a great challenge for waterworks in the coming decade.

**Keywords:** Corrosion, water-pipe network, steel, cast iron, corrosion deposits, deposit structure, water quality.