HISTORY OF GUIDELINE DEVELOPMENT

Chlorine dioxide, chlorite and chlorate

The 1958, 1963 and 1971 WHO International Standards for Drinking-water and the first edition of the Guidelines for Drinking-water Quality, published in 1984, did not refer to chlorine dioxide, chlorate or chlorite. The 1993 Guidelines established a provisional health-based guideline value of 0.2 mg/l for chlorite in drinking-water. The guideline value was designated as provisional because use of chlorine dioxide as a disinfectant may result in the chlorite guideline value being exceeded, and difficulties in meeting the guideline value must never be a reason for compromising disinfection. The 1993 Guidelines did not establish a health-based guideline value for chlorine dioxide in drinking-water because of its rapid breakdown and because the provisional guideline value for chlorite was adequately protective for potential toxicity from chlorine dioxide. The 1993 Guidelines concluded that available data on the effects of chlorate in humans and experimental animals are insufficient to permit development of a guideline value and recommended that further research was needed to characterize the non-lethal effects of chlorate. The third edition of the Guidelines, published in 2004, established provisional guideline values of 0.7 mg/l for both chlorite and chlorate. The guideline values were designated as provisional because use of chlorine dioxide as a disinfectant may result in the guideline values being exceeded, and difficulties in meeting the guideline values must never be a reason for compromising adequate disinfection. This assessment was brought forward to the fourth edition of the Guidelines, published in 2011. The first addendum to the fourth edition of the Guidelines, published in 2017, reconfirmed the provisional guideline values of 0.7 mg/L for chlorite and chlorate. It also noted that a guideline value for chlorine dioxide was not needed as chlorine dioxide is reduced primarily to chlorite, chlorate and chloride in drinking-water, and to chlorite and chloride upon ingestion; therefore, the provisional guideline values for chlorite and chlorate are protective for potential toxicity from chlorine dioxide.