Chemical oxidation technologies have been used for many years to degrade a wide range of pollutants in wastewater and drinking water. Advanced chemical oxidation typically involves the use of chemical oxidants (e.g. ozone or hydrogen peroxide) to generate hydroxyl radicals (i.e. \( \cdot \)OH), one of the strongest oxidants known. Hydroxyl radicals are reactive and non-selective, capable of rapidly degrading a number of organic compounds. It comprises a range of similar-but different chemical processes aimed at tackling pollution in water, air and soil. Over the past few decades, multidisciplinary research has been carried out to study a broad spectrum of topics such as understanding of process fundamentals, elucidation of kinetics and mechanisms, development of new materials, modelling, process integration and scale-up. It is generally believed that the efficacy of AOPs to treat a certain polluted water is a strong function of (i) the composition and concentration pollutant and and (ii) the type of treatment method itself [1].

Research highlights, case studies and some important directions concerning R&D on AOTs for water and wastewater treatment will be presented. Each method will be evaluated in the basis of their main mechanism, advantages and disadvantages. Additionally the trends for development of new materials to promote efficient treatment; strategies for process integration; process scale-up and commercialization; targeting new classes of pollutants and contaminants will be summarized.

KEYWORDS: advanced oxidation technologies, catalysis, hydroxyl radical

REFERENCES: