Degradation of Refractory Pollutants Primarily Driven by Surface SO_4^- Immobilized on Metal Oxides

김종식†
한국과학기술연구원
(jkim40@kist.re.kr†)

•OH radical is deemed as one of powerful oxidants to decompose non-biodegradable pollutants present in water, yet, remains challenging as for its sustainable utilization as a recalcitrants' consumer. This is ascribed to 1) the short lifetime of •OH particularly effective only within a narrow pH span, 2) a limited number of H2O2 activators to form •OH, 3) the oxidation of Mδ+ species to form M3+ analogues deterred to cleave H2O2 (Mδ+ , M: metal; δ ≤ 2), and 4) the substantial leaching of Mδ+ species to activate H2O2 cleavage via heterogeneous catalysis. Nowadays, it is reported that SO4•− species are used to oxidize aqueous contaminants and offer several advantages such as 1) a longer lifetime and 2) a greater oxidation capability under a wider pH range in comparison with those of •OH radicals. The SO4•− species, however, are not be exempted from the serious leaching of S2O8− activators (Mδ+) to produce SO4•− species.
Keyword: OH, SO42−, SO4•−, radical transfer, oxidative degradation, aqueous contaminants