Two UV-based advanced oxidation processes (AOPs), UV/H2O2 and UV/TiO2, were tested in batch reactor systems to evaluate the removal efficiencies and optimal conditions for the photodegradation of methyl tert-butyl ether (MTBE). The optimal conditions at an initial MTBE concentration of 1 mM ([MTBE]0=1 mM) were acidic and 15 mM H2O2 in UV/H2O2 system, and pH 3.0 and 2.0 g/l TiO2 in UV/TiO2 suspended slurries system under 254-nm UV irradiation. Under the optimal conditions, MTBE photodegradation during the initial period of 60 min in UV/H2O2 and UV/TiO2 systems reached 98 and 80%, respectively. In both systems, MTBE photodegradation decreased with increasing [MTBE]0. While MTBE photodegradation rates increased with increasing dosage of H2O2 (5-15 mM) and TiO2 (0.5-3 g/l), further increase in the dosage of H2O2 (20 mM) or TiO2 (4 g/l) adversely reduced the MTBE photodegradation. Pseudo first-order kinetics with regard to [MTBE] can be used to describe the MTBE photodegradation in both systems. The pseudo first-order rate constants linearly increased with the increase in the molar ratio of [H2O2]0 to [MTBE]0 in UV/H2O2 system and linearly increased with the decrease in [MTBE]0 in UV/TiO2 system.