

Desulfurization characteristics of recarbonized CaCO_3 in Oxy-fuel CFB conditions

강서영, 고은솔, 서수빈, 이시훈[†]
전북대학교
(donald@jbnu.ac.kr[†])

Depending on the operating conditions of Oxy-CFB, limestone have been used for direct desulfurization in Oxy-CFB combustors. Limestone is Ca-based sorbent which is injected into circulating fluidized bed(CFB) boiler and combines with SO_2 to produce calcium sulfate(CaSO_4). As a result, the SO_2 emissions from the power plant can be reduced. However, limestones injected into CFB boilers for desulfurization go through various reactions, such as calcination, recarbonization, and desulfurization. Especially, Oxy-CFB(oxy-fuel circulating fluidized bed) boiler uses pure O_2 and recycled CO_2 from flue gas and high CO_2 concentration may result in recarbonization of CaO produced from calcination. To improve the desulfurization efficiency in Oxy-CFB boiler, the behaviors of limestone should be analyzed in minute detail. This study investigated the behavior and the surface changes of limestones, lime, and calcium sulfate by using TGA, FE-SEM, XRD, and so on. Also, the direct desulfurization reactions of limestones and recarbonized lime were compared and analyzed, too.