

Effect of Nitrites on NaNO_3 promoted MgO absorbent for fast CO_2 capture안영인, 권영욱[†]

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MgO is well known as an intermediate-temperature CO_2 absorbent because its carbonate decomposition temperature range is lower than other alkaline metal oxide. Pure MgO absorbs CO_2 very slowly with poor absorption capacity. NaNO_3 is used as a promoter in order to enhance CO_2 absorption capacity and kinetic of MgO dramatically. But the NaNO_3 -MgO absorbent has several problems for CO_2 absorption. The absorbent has a long induction period of about 30 min and the kinetics of CO_2 absorption is not fast enough. In attempts find additives that overcome the deficiency of NaNO_3 and to achieve better performance in CO_2 absorption with NaNO_3 -MgO absorbent, we found that alkali metal nitrite salts could function as a co-promoter with NaNO_3 . NaNO_3 -MgO absorbent showed high performance for CO_2 absorption with alkali metal nitrite addition and the absorption kinetics of MgO is greatly increased even when the nitrite content is as low as 10 mol%. Alkali metal nitrites in the molten state have higher concentration of oxide ions (O_2^-) than do NaNO_3 . This property can allow fast generation of carbonate and enable fast growth of MgCO_3 . Also, we find another mechanism of this absorbent that alkali metal nitrites make double carbonate with MgO. Details of the study will be reported on the poster.