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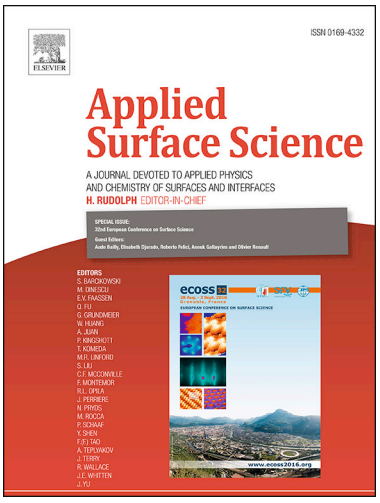

Full Length Article

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PII: S0169-4332(18)32369-9
DOI: https://doi.org/10.1016/j.apsusc.2018.08.226
Reference: APSUSC 40263

To appear in: *Applied Surface Science*

Received Date: 17 May 2018
Revised Date: 3 August 2018
Accepted Date: 26 August 2018

Please cite this article as: Y. Liu, P. Zhang, J. Zhan, L. Liu, Heat Treatment of $MnCO_3$: An Easy Way to Obtain Efficient and Stable MnO_2 for Humid O_3 Decomposition, *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.08.226

Heat Treatment of $MnCO_3$: An Easy Way to Obtain Efficient and Stable MnO_2 for Humid O_3 Decomposition

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Abstract

The competitive water adsorption in the practical environment usually causes severe deactivation of the O_3 decomposition catalysts. In this study, $MnCO_3$ was used as precursor to prepare efficient and stable MnO_2 catalyst for gaseous O_3 decomposition in humid stream. The sample S-300, prepared by calcining $MnCO_3$ at 300 ^oC for 6 h, exhibited 63% (80%) of removal efficiency for 120 (43) ppm of O_3 under a high space velocity of 600 $L \cdot g^{-1} \cdot h^{-1}$ and 50% (40%) of relative humidity at 25 ^oC, which is superior to the commercial O_3 scrubber (oxide compound of Cu and Mn) and α-MnO_2. However, even lower or higher treatment temperature did not further promote humid O_3 decomposition. Thorough characterizations, especially by the temperature programmed and *in situ* DRIFTs experiments, demonstrate that the large