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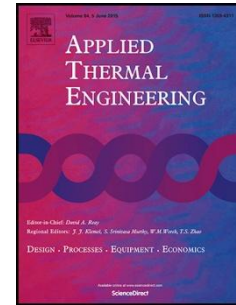
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1 Thermal behavior and kinetics of municipal solid waste during pyrolysis and combustion process

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5 **Highlights**

6 Thermogravimetric analysis of MSW pyrolysis and combustion were studied.

7 The additives (ZnO, Fe₂O₃ and Al₂O₃) facilitated the pyrolysis and combustion of MSW.

8 The additive CuO prohibited the decomposition and combustion of biowaste matter.

9 High oxygen concentration provided more help in combustion of MSW.

10 Kinetic parameters were calculated to appraise the pyrolysis and combustion of MSW.

11

12 **Abstract**

13 The thermal behavior of municipal solid waste (MSW) in south China during pyrolysis and
14 combustion processes were investigated via thermogravimetric analysis. In order to investigate the
15 effect of metal oxides in the grate ash, the pyrolysis and combustion experiments were carried out with
16 and without additives (ZnO, Fe₂O₃, CuO and Al₂O₃). Different artificial atmospheres (O₂: N₂=1:9, O₂:
17 N₂=3:7, O₂: N₂=5:5, O₂: N₂=7:3) were adopted to investigate the oxygen-enriched combustion
18 characteristics. Results showed that all additives facilitated the decomposition of MSW, while the CuO
19 prohibited the decomposition of biowaste matter. The same effort was applied on the combustion

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