Reaction kinetics for the preparation of $LaMnO_3$ powder by means of self-propagating reaction

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$LaMnO_3$ has been recognized as the host material for the solid oxide fuel cells (SOFC) which exhibited their potential use as clean and efficient powder-generating devices. The reaction for the preparation of $LaMnO_3$ powder was analyzed by using TGA to predict the preparation kinetics. The extremely rapid weight loss giving rise to a very sharp exothermicity indicated that the reaction for the preparation of $LaMnO_3$ powder from the precursors with Citric acid was the self-propagating reaction. The reaction order, activation energy during the non-isothermal reaction were predicted by adopting the Friedman, Ozawa-Flynn-wall and Vyazovkin methods. The optimum ratio of C/N was 0.8 for the optimum performance of the self-propagating auto-ignition reaction to prepare $LaMnO_3$ powder within this experimental condition.