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Weakly agglomerated α -Al₂O₃ nanopowders prepared by a novel spray precipitation method

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Abstract

In this paper, weakly agglomerated and well dispersed α -Al₂O₃ powders were synthesized by a novel spray precipitation method. It was demonstrated that the as-prepared powders exhibited better dispersity than powders from conventional precipitation due to the increased phase contact and reaction area during the precipitation process. The effects of different titration ways, calcination temperature and holding time on the morphology, phase composition and sintering behaviour of Al₂O₃ powders were systematically investigated. Weakly agglomerated and well crystallized α -Al₂O₃ powders were obtained when the as-prepared precursors were calcined at 1150 °C for 2 h in air. The average particle size of α -Al₂O₃ powders with higher sintering activity was approximately 68.6 nm, and the specific surface area was above 22.4 m²·g⁻¹.

Keywords

Spray precipitation; Calcination temperature; Holding time; α -Al₂O₃ powders

1. Introduction

α -Al₂O₃ powders have attracted much attention because of their excellent mechanical and chemical performance [1-3]; these powders have been widely used in many fields such as optical ceramics, refractory materials and circuit substrates [4-6].

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