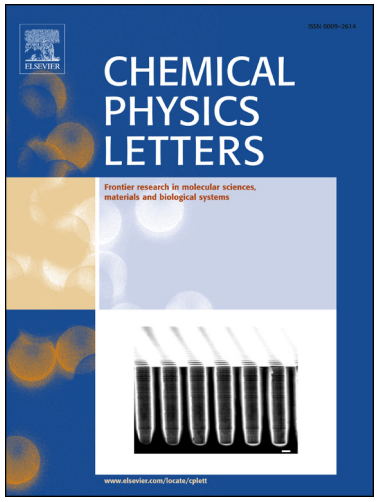

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Kinetics of the mechanochemical synthesis of alkaline-earth metal amides

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Abstract

A phenomenological framework is developed to model the kinetics of the formation of alkaline-earth metal amides by the ball milling induced reaction of their hydrides with gaseous ammonia. It is shown that the exponential character of the kinetic curves is modulated by the increase of the total volume of the powder inside the reactor due to the substantially larger molar volume of the products compared to the reactants. It is claimed that the volume of powder effectively processed during each collision connects the transformation rate to the physical and chemical processes underlying the mechanochemical transformations.

Keywords: Mechanochemistry; Metal amides; Kinetics; Modeling.

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