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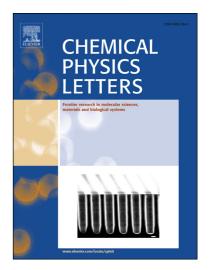
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# **ACCEPTED MANUSCRIPT**

## Kinetics of the mechanochemical synthesis of alkaline-earth metal amides

Sebastiano Garroni<sup>1</sup>, Laszlo Takacs<sup>2</sup>, Haiyan Leng<sup>3,4</sup>, Francesco Delogu<sup>5,\*</sup>

Dipartimento di Chimica e Farmacia, Università degli Studi di Sassari, via Vienna 2, 07100 Sassari, Italy

<sup>2</sup> Department of Physics, University of Maryland, Baltimore County, Baltimore, MD 21250, U.S.A.

<sup>3</sup> Shanghai Key Lab of Modern Metallurgy and Materials Processing, Shanghai University, Yanchang Rd. 149, 200072 Shanghai, China

<sup>4</sup> Institute for Advanced Materials Research, Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima 739-8530, Japan

<sup>5</sup> Dipartimento di Ingegneria Meccanica, Chimica, e dei Materiali, Università degli Studi di Cagliari, via Marengo 2, 09123 Cagliari, Italy

#### **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.

<sup>\*</sup> Corresponding author: francesco.delogu@unica.it

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