

## Effects of Ball Milling Conditions on the Hydrogen Sorption of Mg and Cr<sub>2</sub>O<sub>3</sub> Nanopowders

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### ABSTRACT

Mg powders with 1%wt of Cr<sub>2</sub>O<sub>3</sub> and 1%wt of Boro powders catalysts were obtained by high energy ball milling. A continuous particle size reduction was observed by SEM as result of grinding time and it was confirmed by XRD. However, the superficial area values obtained by BET show a reduction in the superficial area with increasing grinding time. The hydrogen sorption studied at -198°C showed a poor hydrogen storage capability in the samples treated at 80 minutes of grinding. The low hydrogen adsorption could be due to the formation of MgO and Mg(OH)<sub>2</sub> and due to the sintering processes of powder particles generating agglomerates. Therefore, although the particle size decreased with grinding time, the superficial areal decrease as a consequence of the formation of agglomerates. However, increasing the milling time, for instance 280 min, the hydrogen adsorption increased which can be associated with the destruction of the agglomerates. The incorporation of boron improved the hydrogen adsorption.

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