

Tribomechanical Treatment of Vanadium- Containing Oxides: Propane Oxidative Dehydrogenation

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Introduction

V_2O_5 , V_2O_5/TiO_2 , Sb_2O_3/TiO_2 , and $V_2O_5/Sb_2O_3/TiO_2$ were milled in a planetary ball mill between 1 to 20 h. The interaction between V_2O_5 , Sb_2O_3 and TiO_2 under milling was characterised by SEM, TEM and was tested for their catalytic activity towards propane oxidative dehydrogenation (ODH). Titania supported vanadia catalyst were modified by addition of antimony oxide for application in propane oxidative dehydrogenation. Ball milling reduces the particle size, destroys the structure and leads to the reduction of V_2O_5 . Ball milling of the ternary system ($V_2O_5/Sb_2O_3/TiO_2$) results in the fine dispersion of V_2O_5 . The ternary system also exhibits higher performance to propane ODH.

Keywords: V_2O_5 , Sb_2O_3 , TiO_2 , mechanochemical treatment, propane oxidative dehydrogenation, electron microscopy

