

Supporting Information

Catalytic Dehydrogenation of Isobutane over Ga₂O₃/ZnO Interface: Reaction Routes and Mechanism

By

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Table S1. Dehydrogenation performance of different catalysts.

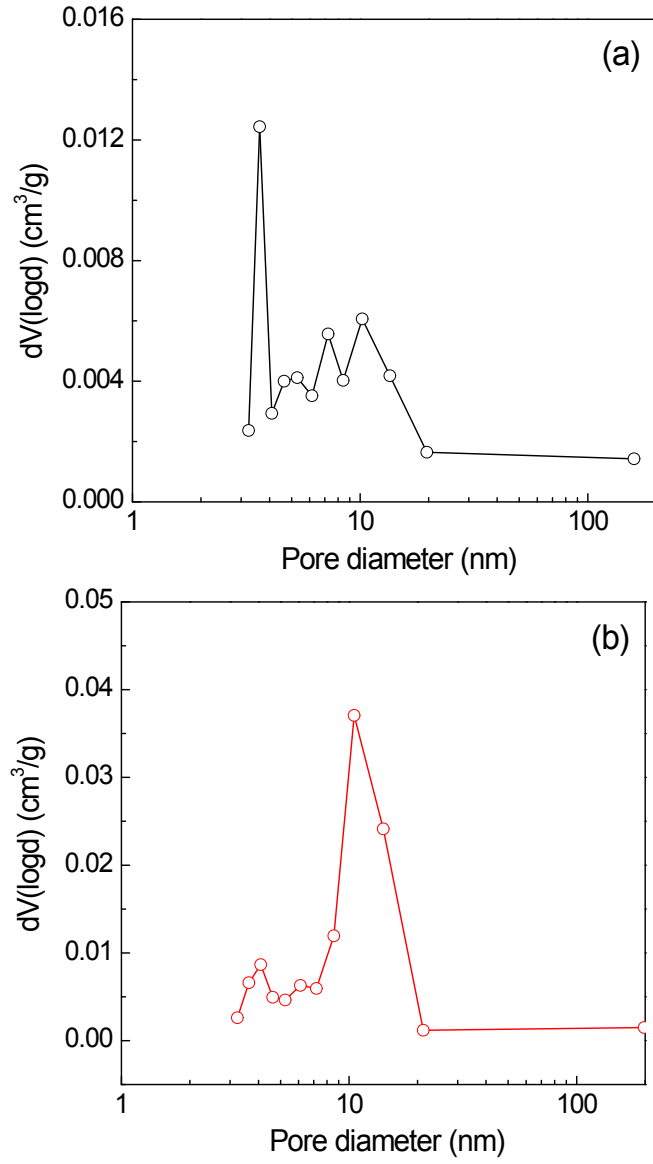


Figure S1. Pore size distributions of (a) ZnO and (b) Ga_2O_3 .

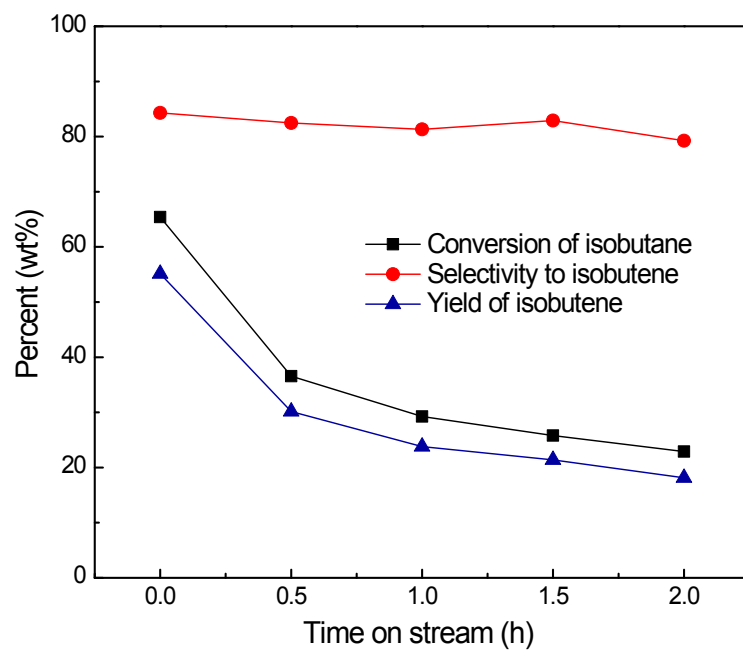


Figure S2. Dehydrogenation performance of isobutane over 5ZnO-Ga₂O₃ catalyst with TOS under the reaction conditions of 560 °C, 4 mL catalyst loading, and 210 h⁻¹ gas space velocity.

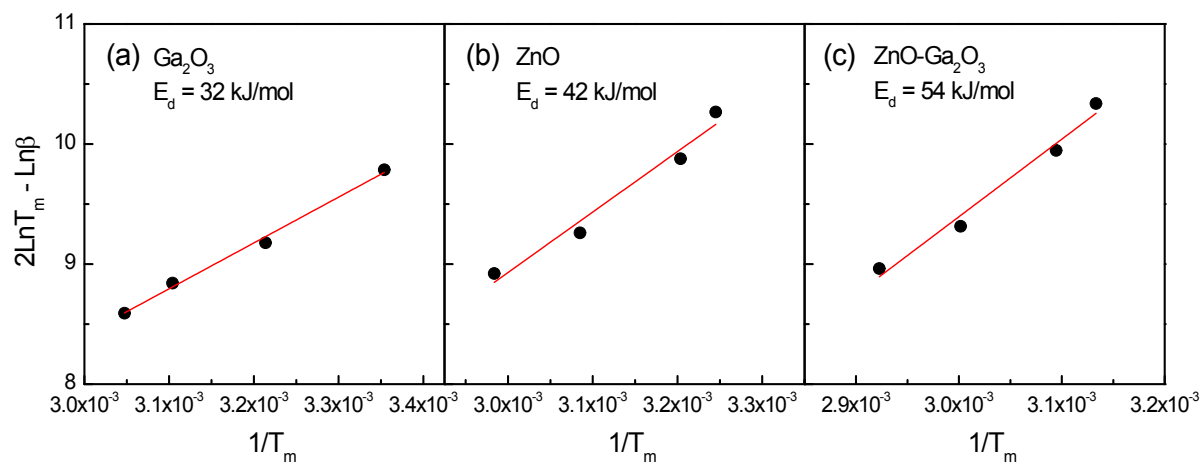


Figure S3. Cvetanovic curves obtained by isobutane TPD experiments over different samples: (a) Ga_2O_3 ; (b) ZnO ; (c) $5\text{ZnO-Ga}_2\text{O}_3$.

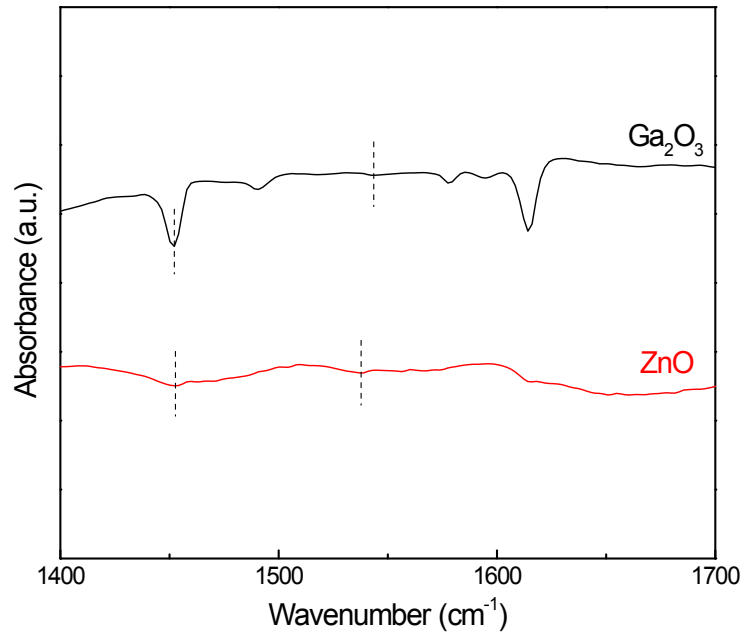


Figure S4. Pyridine IR spectra of Ga_2O_3 and ZnO samples.

Table S1. Dehydrogenation performance of different catalysts^a

Sample	Isobutane conversion, wt%	Isobutene selectivity, wt%	Isobutene yield, wt%
(a) 5ZnO-Ga ₂ O ₃ (20-60 mesh) ^b	46.4	76.2	35.4
(b) 5ZnO-Ga ₂ O ₃ (20-60 mesh) ^c	62.4	84.7	52.9
5ZnO-Al ₂ O ₃	50.1	84.4	42.3

^a Reaction conditions: 560 °C, 4 mL catalyst loading, and 210 h⁻¹ gas space velocity.

^b Sample (a) was fabricated by separately pressing and grinding ZnO and Ga₂O₃ into 20-60 mesh particles, and then mixing together.

^c Sample (b) was fabricated by mixing ZnO and Ga₂O₃ together firstly, and then pressing and grinding the mixture into 20-60 mesh particles.