

Table 1. Textural properties of Zr, Zr_xAl_y and Al catalysts.

Catalyst	S_{BET} (m² g⁻¹)	<i>t</i>-plot (m² g⁻¹)	V_P (cm³ g⁻¹)	V_{microp} (cm³ g⁻¹)
Zr	101	12	0.10	0.01
Zr ₇ Al ₃	184	127	0.11	0.06
Zr ₅ Al ₅	241	167	0.15	0.08
Zr ₃ Al ₇	304	175	0.26	0.09
Al	312	185	0.27	0.10

Table 2. Acid-base properties for Zr, Zr_xAl_y and Al catalysts.

Catalyst	NH ₃ chemisorbed (μmol g ⁻¹)			CO ₂ chemisorbed (μmol g ⁻¹)	
	Total	Weak (100-200 °C)	Medium (300-400 °C)	Strong (> 400 °C)	Total
Zr	489	221	233	35	4
Zr ₇ Al ₃	780	414	335	31	11
Zr ₅ Al ₅	1115	522	472	120	27
Zr ₃ Al ₇	966	421	425	20	39
Al	959	382	438	139	26

Table 3. Spectral parameters, atomic concentration and superficial molar ratio on the Surface of Zr, Zr_xAl_y and Al catalysts (determined by XPS).

Catalyst	Binding energy (eV) Atomic concentrations (%)				Superficial molar ratio	
	C 1s	O 1s	Al 2p	Zr 3d	Al/Zr ratio	Al/Zr theoretical ratio
Zr	284.8 eV (8.47%)	532.0 eV (62.26%)	-	182.2 eV (29.25%)	-	-
Zr ₇ Al ₃	284.8 eV (8.11%)	531.8 eV (64.42%)	74.6 eV (9.12%)	182.9 eV (25.97%)	0.35	0.43
Zr ₅ Al ₅	284.8 eV (9.70%)	531.5 eV (61.29%)	74.9 eV (14.60%)	182.9 eV (14.39%)	1.01	1.00
Zr ₃ Al ₇	284.8 eV (4.87%)	531.4 eV (61.49%)	74.6 eV (23.73%)	182.7 eV (9.93%)	2.38	2.30
Al	284.8 eV (11.12%)	531.4 eV (62.79%)	74.6 eV (26.08%)	-	-	-