

Supplementary Materials: Hydrochlorination of Acetylene Catalyzed by an Activated Carbon-Supported Ammonium Hexachlororuthenate Complex

Junjie Gu, Yumiao Gao, Jinli Zhang, Wei Li, Yanzhao Dong and You Han

Table S1. Weight loss of fresh and used catalysts with 1.0 wt % Ru loading under different temperature ranges.

Catalysts	Weight Loss (%)	
	<150 (°C)	150–360 (°C)
Fresh RuCl ₃ /AC	1.32	2.68
Used RuCl ₃ /AC	0.73	16.39
Fresh (NH ₄) ₂ RuCl ₆ /AC	1.31	0.87
Used (NH ₄) ₂ RuCl ₆ /AC	0.79	9.99

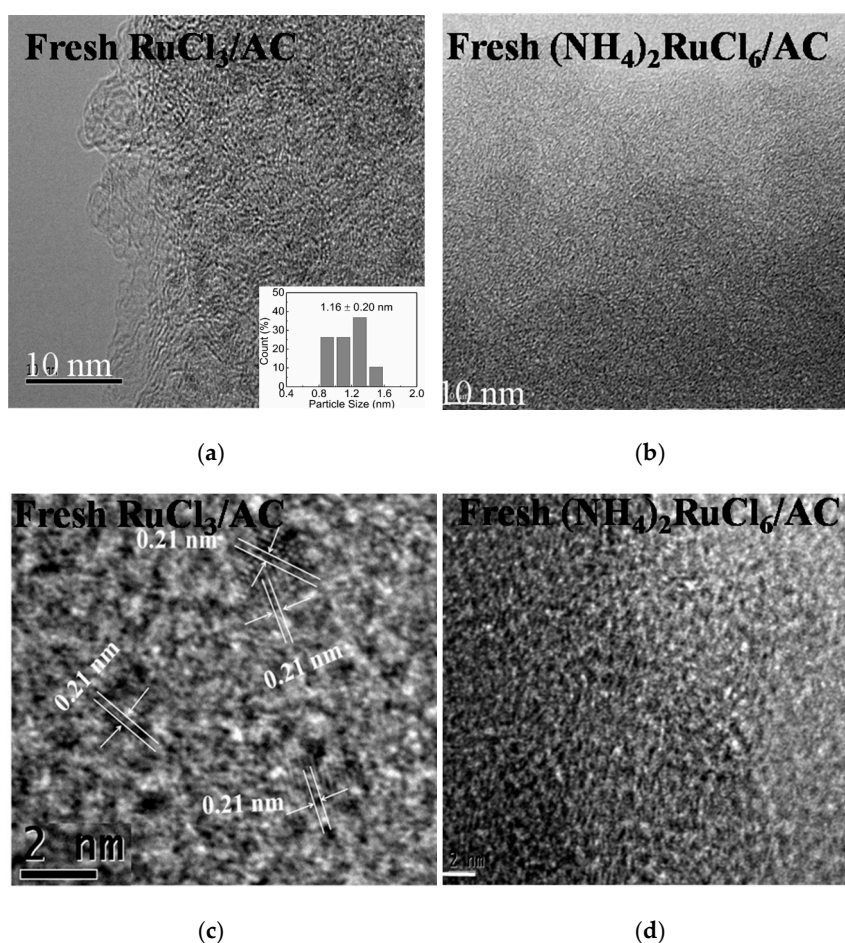


Figure S1. TEM images of the fresh Ru-based catalysts with 1.0 wt % Ru loading. (a) Fresh RuCl₃/AC; (b) Fresh (NH₄)₂RuCl₆/AC; (c) HRTEM image of Fresh RuCl₃/AC; (d) HRTEM image of Fresh (NH₄)₂RuCl₆/AC.

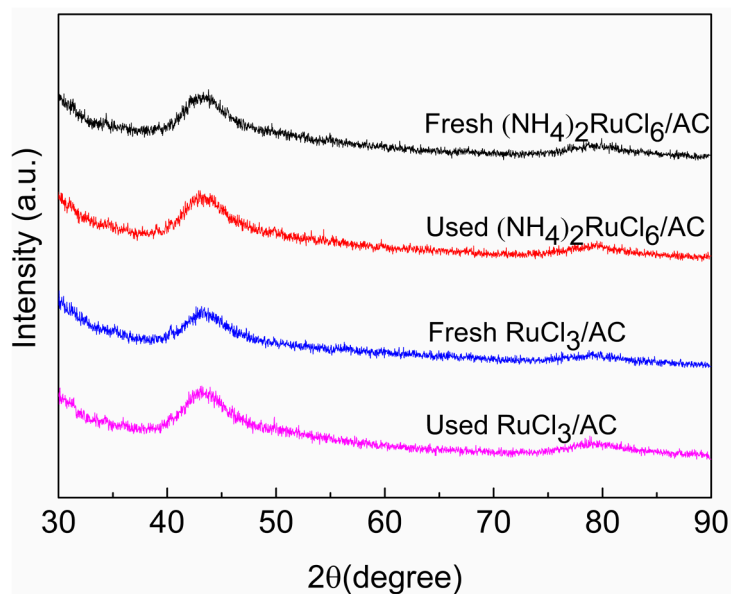


Figure S2. XRD patterns of the fresh and used Ru-based catalysts with 1.0 wt % Ru loading.

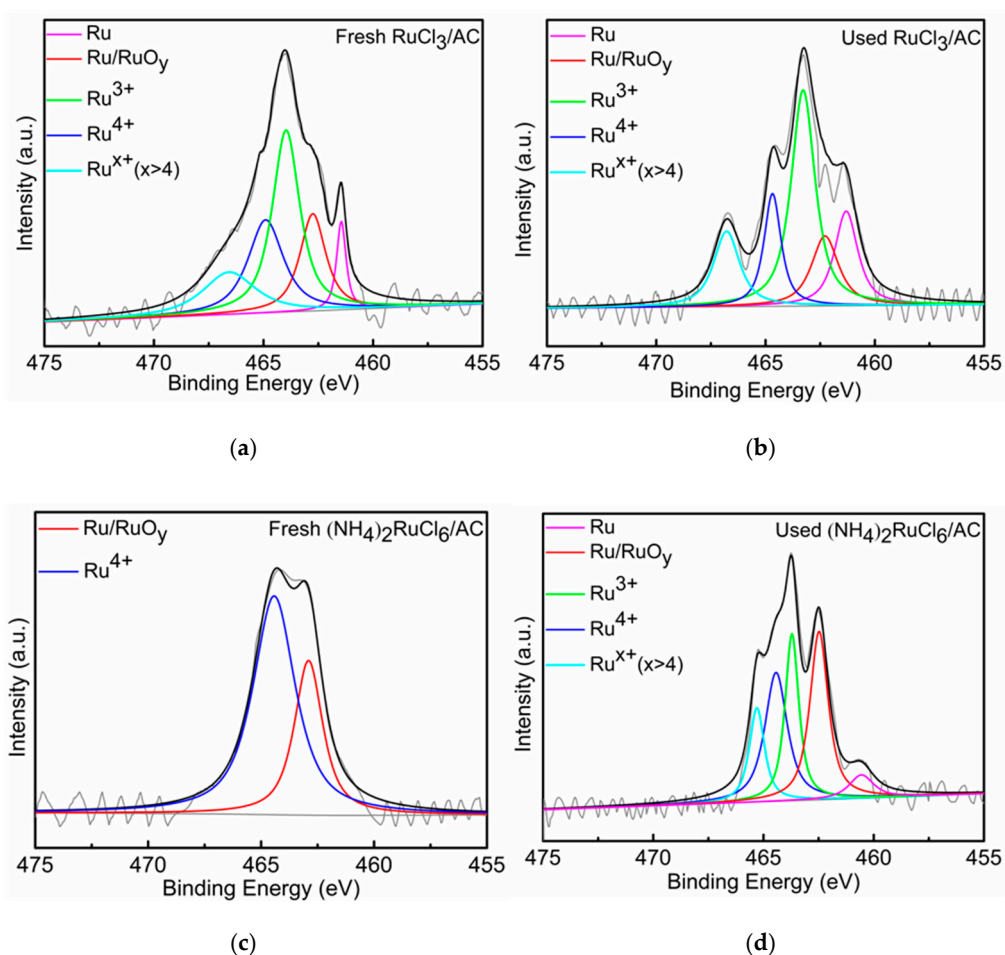


Figure S3. XPS patterns of Ru $3p_{3/2}$ for fresh and used 1.0 wt% Ru-catalysts. (a) Fresh RuCl_3/AC ; (b) Used RuCl_3/AC ; (c) Fresh $(\text{NH}_4)_2\text{RuCl}_6/\text{AC}$; (d) Used $(\text{NH}_4)_2\text{RuCl}_6/\text{AC}$.

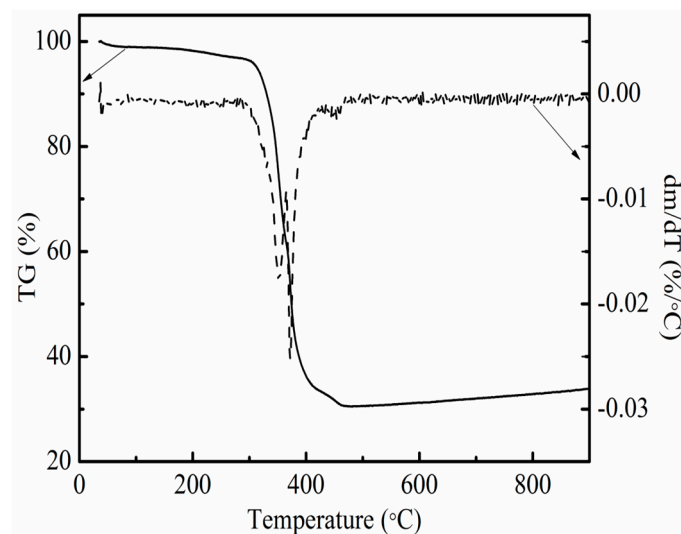


Figure S4. TG curve of complex $(\text{NH}_4)_2\text{RuCl}_6$ under nitrogen atmosphere.

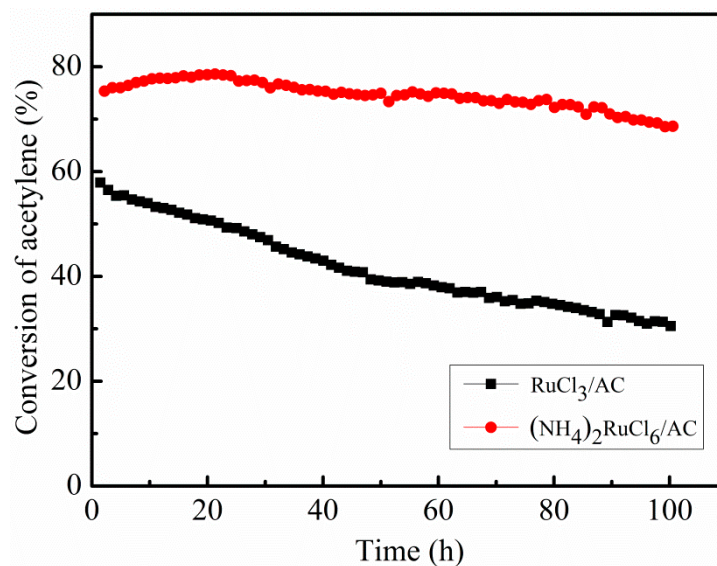


Figure S5. Comparison of stability of RuCl_3/AC and $(\text{NH}_4)_2\text{RuCl}_6/\text{AC}$. Reaction conditions: $T=170\text{ }^\circ\text{C}$, $GHSV(\text{C}_2\text{H}_2) = 360\text{ h}^{-1}$, $V(\text{HCl})/V(\text{C}_2\text{H}_2) = 1.1$, the Ru loading content = 1 wt %.

Table S2. The amount of coke deposition on the used 1.0 wt % Ru-based catalysts.

Catalyst	Amount of Coke Deposition (%)
RuCl_3/AC	19.7
$(\text{NH}_4)_2\text{RuCl}_6/\text{AC}$	13.5

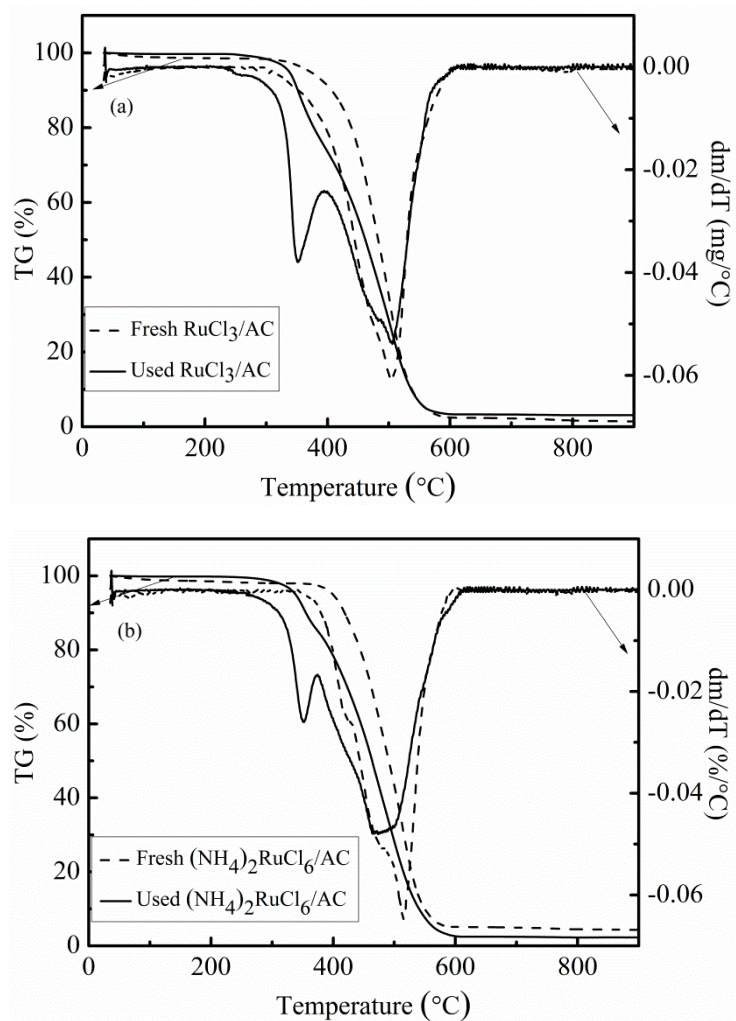


Figure S6. TG and DTG curves of the fresh and used 1.0 wt % Ru-based catalysts (a) RuCl₃/AC, (b) (NH₄)₂RuCl₆/AC.