Supplementary Information

Table S1. List of metal oxide-supported Ru (5 wt. %) catalysts.

Entry	Catalyst	S_{BET} ($m^2 \cdot g^{-1}$)	2a Yield (%)
1	Ru/γ-Al_2O_3	156	94
2	Ru/θ-Al_2O_3	84	92
3	Ru/α-Al_2O_3	15	66
4	Ru/CaO	8	5
5	Ru/MgO	18	53
6	Ru/ZrO_2	74	90
7	Ru/CeO_2	69	70
8	Ru/Nb_2O_5	40	18
9	Ru/SnO_2	25	0
10	Ru/ZSM-5	295	9
11	Ru/MCM-41	647	9

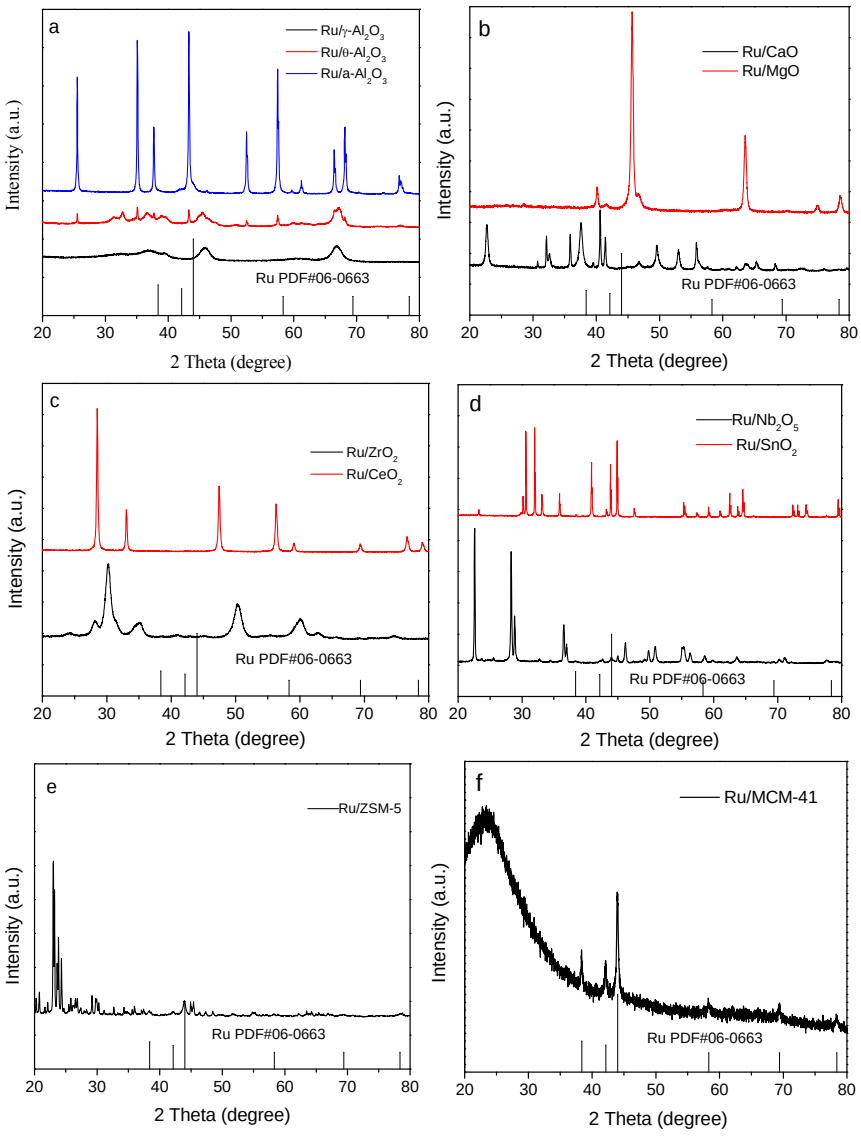

Figure S1. XRD patterns of (**a**) Ru/γ-Al_2O_3, Ru/θ-Al_2O_3, Ru/α-Al_2O_3, (**b**) Ru/MgO, Ru/CaO, (**c**) Ru/ZrO_2, Ru/CeO_2, (**d**) Ru/Nb_2O_5, Ru/SnO_2, (**e**) Ru/ZSM-5 and (**f**) Ru/MCM-41.

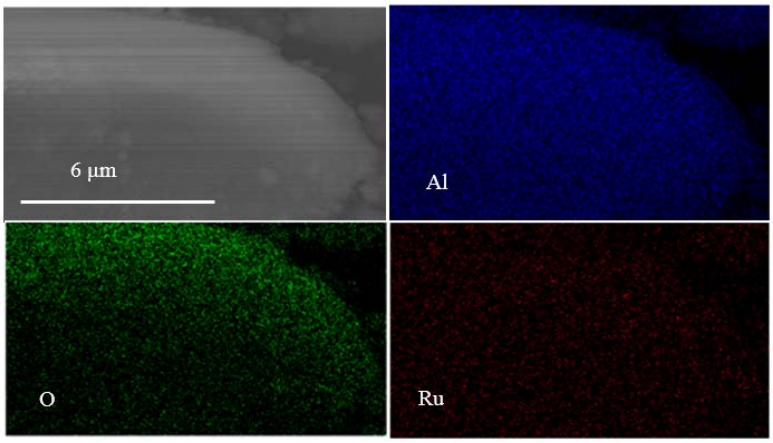

Figure S2. Typical SEM images of Ru/γ-Al_2O_3 and its images and the corresponding elemental mapping images of Al, O and Ru.

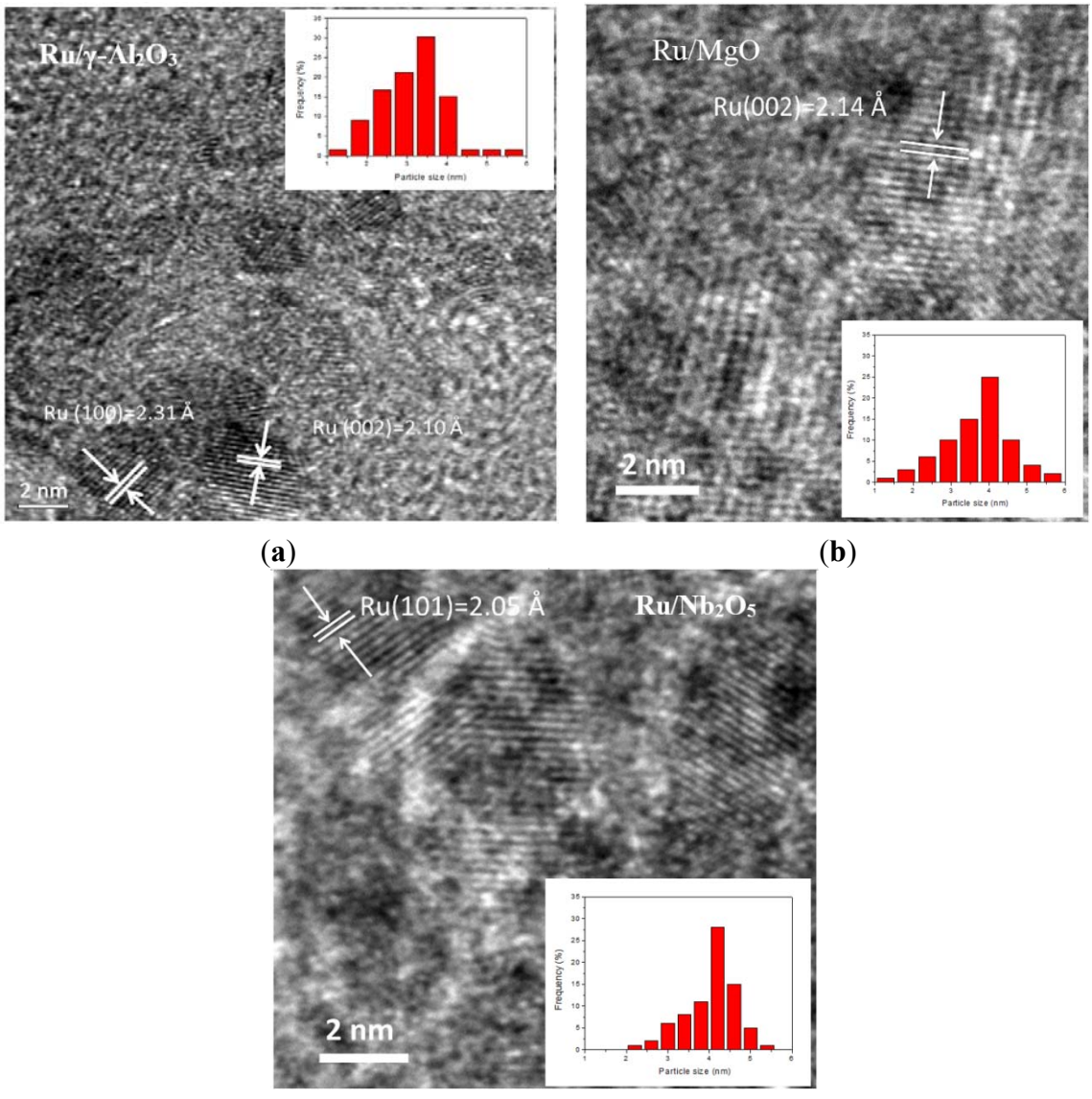

Figure S3. Typical TEM images and particle size distribution of (**a**) Ru/γ-Al_2O_3, (**b**) Ru/MgO and (**c**) Ru/Nb_2O_5.

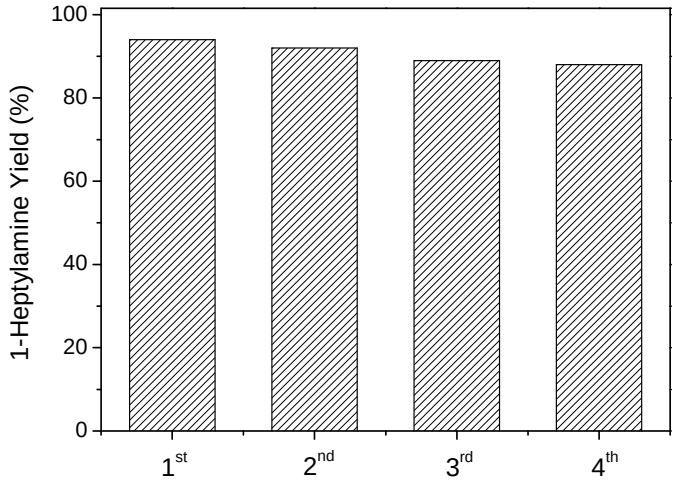

Figure S4. Recycling runs in reductive amination of heptaldehyde in the presence of NH_3 and H_2 with Ru/γ-Al_2O_3 as catalyst at 80 °C for 2 h.