

Supplementary Materials

Table 1 Table of reactions related to main products

	Reaction
R1	$\text{C}_2\text{H}_4 + \text{H} \rightarrow \text{C}_2\text{H}_3 + \text{H}_2$
R2	$\text{C}_2\text{H}_4 \rightarrow \text{C}_2\text{H}_3 + \text{H}$
R3	$\text{C}_2\text{H}_4 + \text{H} \rightarrow \text{C}_2\text{H}_5$
R4	$\text{C}_2\text{H}_4 \rightarrow \text{C}_2\text{H}_3 + \text{H}$
R5	$\text{C}_4\text{H}_8 \rightarrow \text{C}_2\text{H}_4 + \text{C}_2\text{H}_4$
R6	$\text{C}_6\text{H}_{12} \rightarrow \text{C}_2\text{H}_4 + \text{C}_4\text{H}_8$
R7	$\text{C}_8\text{H}_{16} \rightarrow \text{C}_2\text{H}_4 + \text{C}_6\text{H}_{12}$
R8	$\text{C}_3\text{H}_7 \rightarrow \text{C}_2\text{H}_4 + \text{CH}_3$
R9	$\text{C}_{10}\text{H}_{20} \rightarrow \text{C}_2\text{H}_4 + \text{C}_8\text{H}_{16}$
R10	$\text{C}_2\text{H}_3 \rightarrow \text{C}_2\text{H}_2 + \text{H}$
R11	$\text{C}_2\text{H}_3 + \text{H} \rightarrow \text{C}_2\text{H}_2 + \text{H}_2$
R12	$\text{C}_2\text{H}_2 \rightarrow \text{C}_2\text{H} + \text{H}$
R13	$\text{C}_3\text{H}_5 \rightarrow \text{C}_2\text{H}_2 + \text{CH}_3$
R14	$\text{H} + \text{H} \rightarrow \text{H}_2$
R15	$\text{C}_2\text{H}_5 \rightarrow \text{C}_2\text{H}_3 + \text{H}_2$
R16	$\text{CH}_4 \rightarrow \text{CH}_2 + \text{H}_2$
R17	$\text{C}_3\text{H}_5 \rightarrow \text{C}_3\text{H}_3 + \text{H}_2$
R18	$\text{CH}_3 + \text{H} \rightarrow \text{CH}_4$
R19	$\text{CH}_5 \rightarrow \text{CH}_4 + \text{H}$
R20	$\text{C}_3\text{H}_5 + \text{CH}_3 \rightarrow \text{C}_3\text{H}_4 + \text{CH}_4$