



$\text{CO}_2 + * \rightarrow \text{CO}_2^*$	$\text{CO}_2 + * \leftarrow \text{CO}_2^*$
$\text{H}_2 + 2 * \rightarrow 2 \text{H}^*$	$\text{H}_2 + 2 * \leftarrow 2 \text{H}^*$
$\text{H}_2\text{O} + * \rightarrow \text{H}_2\text{O}^*$	$\text{H}_2\text{O} + * \leftarrow \text{H}_2\text{O}^*$
$\text{CO}_2^* + * \rightarrow \text{CO}^* + \text{O}^*$	$\text{CO}_2^* + * \leftarrow \text{CO}^* + \text{O}^*$
$\text{CO}_2^* + \text{H}^* \rightarrow \text{HCOO}^* + *$	$\text{CO}_2^* + \text{H}^* \leftarrow \text{HCOO}^* + *$
$\text{CO}_2^* + \text{H}^* \rightarrow \text{COOH}^* + *$	$\text{CO}_2^* + \text{H}^* \leftarrow \text{COOH}^* + *$
$\text{CO}_2^* + \text{OH}^* \rightarrow \text{COOH}^* + \text{O}^*$	$\text{CO}_2^* + \text{OH}^* \leftarrow \text{COOH}^* + \text{O}^*$
$\text{CO}_2^* + \text{H}_2\text{O}^* \rightarrow \text{COOH}^* + \text{OH}^*$	$\text{CO}_2^* + \text{H}_2\text{O}^* \leftarrow \text{COOH}^* + \text{OH}^*$
$\text{CO}_2^* + \text{OH}^* \rightarrow \text{HCOO}^* + \text{O}^*$	$\text{CO}_2^* + \text{OH}^* \leftarrow \text{HCOO}^* + \text{O}^*$
$\text{CO}_2^* + \text{H}_2\text{O}^* \rightarrow \text{HCOO}^* + \text{OH}^*$	$\text{CO}_2^* + \text{H}_2\text{O}^* \leftarrow \text{HCOO}^* + \text{OH}^*$
$\text{COOH}^* + * \rightarrow \text{CO}^* + \text{OH}^*$	$\text{COOH}^* + * \leftarrow \text{CO}^* + \text{OH}^*$
$\text{COOH}^* + * \rightarrow \text{COH}^* + \text{O}^*$	$\text{COOH}^* + * \leftarrow \text{COH}^* + \text{O}^*$
$\text{HCOO}^* + * \rightarrow \text{O}^* + \text{HCO}^*$	$\text{HCOO}^* + * \leftarrow \text{O}^* + \text{HCO}^*$
$\text{CO}^* + * \rightarrow \text{C}^* + \text{O}^*$	$\text{CO}^* + * \leftarrow \text{C}^* + \text{O}^*$
$\text{HCO}^* + * \rightarrow \text{CO}^* + \text{H}^*$	$\text{HCO}^* + * \leftarrow \text{CO}^* + \text{H}^*$
$\text{HCO}^* + * \rightarrow \text{CH}^* + \text{O}^*$	$\text{HCO}^* + * \leftarrow \text{CH}^* + \text{O}^*$
$\text{COH}^* + * \rightarrow \text{CO}^* + \text{H}^*$	$\text{COH}^* + * \leftarrow \text{CO}^* + \text{H}^*$
$\text{COH}^* + * \rightarrow \text{C}^* + \text{OH}^*$	$\text{COH}^* + * \leftarrow \text{C}^* + \text{OH}^*$
$\text{C}^* + \text{H}^* \rightarrow \text{CH}^* + *$	$\text{C}^* + \text{H}^* \leftarrow \text{CH}^* + *$
$\text{CH}^* + \text{H}^* \rightarrow \text{CH}_2^* + *$	$\text{CH}^* + \text{H}^* \leftarrow \text{CH}_2^* + *$
$\text{CH}_2^* + \text{H}^* \rightarrow \text{CH}_3^* + *$	$\text{CH}_2^* + \text{H}^* \leftarrow \text{CH}_3^* + *$
$\text{HCO}^* + \text{H}^* \rightarrow \text{CH}_2\text{O}^* + *$	$\text{HCO}^* + \text{H}^* \leftarrow \text{CH}_2\text{O}^* + *$
$\text{HCO}^* + \text{H}^* \rightarrow \text{HCOH}^* + *$	$\text{HCO}^* + \text{H}^* \leftarrow \text{HCOH}^* + *$
$\text{COH}^* + \text{H}^* \rightarrow \text{HCOH}^* + *$	$\text{COH}^* + \text{H}^* \leftarrow \text{HCOH}^* + *$
$\text{HCOH}^* + * \rightarrow \text{CH}^* + \text{OH}^*$	$\text{HCOH}^* + * \leftarrow \text{CH}^* + \text{OH}^*$
$\text{HCOH}^* + \text{H}^* \rightarrow \text{CH}_2\text{OH}^* + *$	$\text{HCOH}^* + \text{H}^* \leftarrow \text{CH}_2\text{OH}^* + *$
$\text{CH}_2\text{OH}^* + * \rightarrow \text{CH}_2^* + \text{OH}^*$	$\text{CH}_2\text{OH}^* + * \leftarrow \text{CH}_2^* + \text{OH}^*$
$\text{CH}_2\text{OH}^* + \text{H}^* \rightarrow \text{CH}_3\text{OH}^* + *$	$\text{CH}_2\text{OH}^* + \text{H}^* \leftarrow \text{CH}_3\text{OH}^* + *$
$\text{CH}_2\text{O}^* + \text{H}^* \rightarrow \text{CH}_2\text{OH}^* + *$	$\text{CH}_2\text{O}^* + \text{H}^* \leftarrow \text{CH}_2\text{OH}^* + *$
$\text{CH}_2\text{O}^* + * \rightarrow \text{CH}_2^* + \text{O}^*$	$\text{CH}_2\text{O}^* + * \leftarrow \text{CH}_2^* + \text{O}^*$
$\text{CH}_2\text{O}^* + \text{H}^* \rightarrow \text{CH}_3\text{O}^* + *$	$\text{CH}_2\text{O}^* + \text{H}^* \leftarrow \text{CH}_3\text{O}^* + *$
$\text{CH}_3\text{O}^* + * \rightarrow \text{CH}_3^* + \text{O}^*$	$\text{CH}_3\text{O}^* + * \leftarrow \text{CH}_3^* + \text{O}^*$
$\text{CH}_3\text{O}^* + \text{H}^* \rightarrow \text{CH}_3\text{OH}^* + *$	$\text{CH}_3\text{O}^* + \text{H}^* \leftarrow \text{CH}_3\text{OH}^* + *$
$\text{CH}_3\text{OH}^* + * \rightarrow \text{CH}_3^* + \text{OH}^*$	$\text{CH}_3\text{OH}^* + * \leftarrow \text{CH}_3^* + \text{OH}^*$
$\text{O}^* + \text{H}^* \rightarrow \text{OH}^* + *$	$\text{O}^* + \text{H}^* \leftarrow \text{OH}^* + *$
$\text{OH}^* + \text{H}^* \rightarrow \text{H}_2\text{O}^* + *$	$\text{OH}^* + \text{H}^* \leftarrow \text{H}_2\text{O}^* + *$
$\text{OH}^* + \text{OH}^* \rightarrow \text{O}^* + \text{H}_2\text{O}^*$	$\text{OH}^* + \text{OH}^* \leftarrow \text{O}^* + \text{H}_2\text{O}^*$
$\text{CH}_4 + 2 * \rightarrow \text{CH}_3^* + \text{H}^*$	$\text{CH}_4 + 2 * \leftarrow \text{CH}_3^* + \text{H}^*$
$\text{CH}_3\text{OH} + * \rightarrow \text{CH}_3\text{OH}^*$	$\text{CH}_3\text{OH} + * \leftarrow \text{CH}_3\text{OH}^*$
$\text{CH}_2\text{O} + * \rightarrow \text{CH}_2\text{O}^*$	$\text{CH}_2\text{O} + * \leftarrow \text{CH}_2\text{O}^*$