

CO2 + * -> CO2* → H2 + 2 * -> 2 H* → CO2* + OH* -> COOH* + O* ★ CO2* + H2O* -> COOH* + OH* * CO2* + OH* -> HCOO* + O* --- CO2* + H2O* -> HCOO* + OH* --- COOH* + * -> CO* + OH* --- COOH* + * -> COH* + O* --- HCOO* + * -> O* + HCO* --- CO* + * -> C* + O* --- HCO* + * -> CO* + H* --- HCO* + * -> CH* + O* --- COH* + * -> CO* + H* --- COH* + * -> C* + OH* --- C* + H* -> CH* + * --- CH* + H* -> CH2* + * --- CH2* + H* -> CH3* + * --- HCO* + H* -> CH2O* + * --- HCO* + H* -> HCOH* + * --- COH* + H* -> HCOH* + * --- HCOH* + * -> CH* + OH* --- HCOH* + H* -> CH2OH* + * --- CH2OH* + * -> CH2* + OH* --- CH2OH* + H* -> CH3OH* + * --- CH2O* + H* -> CH2OH* + * --- CH2O* + * -> CH2* + O* --- CH2O* + H* -> CH3O* + * --- CH3O* + * -> CH3* + O* --- CH3O* + H* -> CH3OH* + * --- CH3OH* + * -> CH3* + OH* --- O* + H* -> OH* + * --- OH* + H* -> H2O* + * --- OH* + OH* -> O* + H2O*

-- H2O + * -> H2O*

--- CH4 + 2 * -> CH3* + H*

CH3OH + * -> CH3OH*

→ CO2 + * <- CO2* — H2 + 2 * <- 2 H* → CO2* + H* <- COOH* + *</p> ★ CO2* + OH* <- COOH* + O*</p> ★ CO2* + H2O* <- COOH* + OH*
</p> --- CO2* + OH* <- HCOO* + O* --- CO2* + H2O* <- HCOO* + OH* --- COOH* + * <- CO* + OH* --- COOH* + * <- COH* + O* --- HCOO* + * <- O* + HCO* --- CO* + * <- C* + O* --- HCO* + * <- CO* + H* --- HCO* + * <- CH* + O* --- COH* + * <- CO* + H* --- COH* + * <- C* + OH* --- C* + H* <- CH* + * --- CH2* + H* <- CH3* + * --- HCO* + H* <- CH2O* + * --- HCO* + H* <- HCOH* + * --- COH* + H* <- HCOH* + * --- HCOH* + * <- CH* + OH* → HCOH* + H* <- CH2OH* + *</p> --- CH2OH* + * <- CH2* + OH* --- CH2OH* + H* <- CH3OH* + * --- CH2O* + H* <- CH2OH* + * --- CH2O* + * <- CH2* + O* --- CH2O* + H* <- CH3O* + * --- CH3O* + * <- CH3* + O* --- CH3O* + H* <- CH3OH* + * --- CH3OH* + * <- CH3* + OH* --- O* + H* <- OH* + * --- OH* + H* <- H2O* + * ● OH* + OH* <- O* + H2O* ─ H2O + * <- H2O*</p>

--- CH4 + 2 * <- CH3* + H* --- CH3OH + * <- CH3OH*