





PRODUCT ID

Formula	CH ₄ O	CAS nr.	67-56-1
Molecular weight (g/mol)	32.04	EC nr.	200-659-6

VISUAL CLASSIFICATIONS

Market	Energy demand	Maturity	Price
			

KEY MARKET DATA

Market size (ton/year)	80 millions	
Product price (€/ton)	250	
CO ₂ uptake potential (ton/ton product)	1.37	stoichiometric
CO ₂ uptake potential (ton/year)	110 millions	130 reference CEMCAP plants 10% capture target (1.05Gt/year)
State-of-the-art production technology	From methane, via syngas (TRL 9)	

TECHNOLOGY ROUTE: CATALYTIC HYDROGENATION

TRL = 9	Example of commercial application: CRI plant in Iceland with capacity for 4000 t/y	
Reactions		
$CO + 2H_2 = CH_3OH \quad \Delta H_{298}^U = -90.7 \text{ kJ/mol}_{CO}$		
$CO_2 + 3H_2 = CH_3OH + H_2O \quad \Delta H_{298}^U = -49.5 \text{ kJ/mol}_{CO_2}$		
$CO_2 + H_2 = CO + H_2O \quad \Delta H_{298}^U = +41.2 \text{ kJ/mol}_{CO_2}$ reverse water-gas-shift (rWGS)		
Reaction conditions		
Temperature	200 – 250°C	
Pressure	30 – 80 bar	
Catalysts	Cu/ZnO	commercially available
CO ₂ :H ₂ molar ratio	3	stoichiometric
Productivity	0.6 kg.L ⁻¹ .h ⁻¹	
Selectivity	64%	
By-products	36.1% water	
Production cost	400-1000 €/ton	depends on H ₂ cost

For sources and definitions, please consult the original report at the [CEMCAP WEBSITE](#)

