

## DERWENT PUBLICATIONS LTD.

43828

43828 E/22 SHELL INT RES MIJ BV 12.12.80-NL-006751 (21.05.82) C07b C07c Prod'n. of oxygenate(s) and paraffin(s) from synthesis gas - by oxygenate synthesis followed by paraffin synthesis from unconverted gas	E17 H04 SHELL 12.12.80 *BE-891-195	E(10-E4E, 10-H1) H(4-E5) N(2, 3-B, 3-D) 003
<p>Prod'n. of oxygenates and paraffinic hydrocarbons is effected in a two-stage process where in the first synthesis gas with an <math>H_2/CO</math> molar ratio of at least 0.5 is contacted with a catalyst (I) contg. one or more metals capable of catalysing the conversion of synthesis gas to oxygenates. If the <math>H_2/CO</math> molar ratio in the 1st-stage effluent is at least 1.5, the 2nd stage is effected by contacting the CO and <math>H_2</math> components of the 1st-stage effluent (opt. together with other components) with a catalyst (IIa) contg. one or more metals (Co, Ni and/or Ru) capable of catalysing the conversion of synthesis gas to paraffinic hydrocarbons. If the <math>H_2/CO</math> molar ratio in the 1st-stage effluent is less than 1.5, <math>H_2O</math> is added in an amt. sufficient to react with CO and thus increase the <math>H_2/CO</math> ratio to at least 1.5, and the catalyst (IIb) in the 2nd stage also contains one or more metals capable of catalysing CO shift conversion.</p> <p><u>ADVANTAGES</u></p> <p>The process avoids problems associated with recycle of</p>	<p>unconverted synthesis gas to the 1st stage.</p> <p><u>DETAILS</u></p> <p>The initial synthesis gas is pref. produced by steam gasification of carbonaceous material at 900-1500°C and 10-100 bar and has an <math>H_2/CO</math> ratio of 0.75-2.5. If the <math>H_2/CO</math> ratio is too low, it can be increased by external or internal shift conversion.</p> <p>The 1st stage is pref. effected at 225-325°C and 50-150 bar using a catalyst capable of converting synthesis gas to methanol and dimethyl ether. The 2nd stage is pref. effected at 175-275°C and 5-100 bar. A specified catalyst of type (IIa) comprises 10-40 pts. wt. Co and 0.25-5 pts. wt. Zr, Ti and Cr on 100 pts. wt. <math>SiO_2</math>. Catalysts of type (IIa) can be used in alternate layers with a shift conversion catalyst.</p> <p>The oxygenates can be sepd. from the 1st-stage effluent and converted to olefins and/or aromatics by a specified additional process. Alternatively, the whole 1st-stage effluent can be passed to the 2nd stage, in which case the 2nd-stage effluent can be treated to recover <math>C_5+</math> hydrocarbons and the remainder then subjected to the additional</p> <p>BE-891195+</p>	

process. In another claimed embodiment, the whole 1st-stage effluent is subjected to the additional process and the effluent from this process (after separating C<sub>4</sub>-olefins) is used as feed in the 2nd stage.(30pp367).