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BOOK REVIEW

# Nick Kanellopoulos (Ed): Small Scale Gas to Liquid Synthesis

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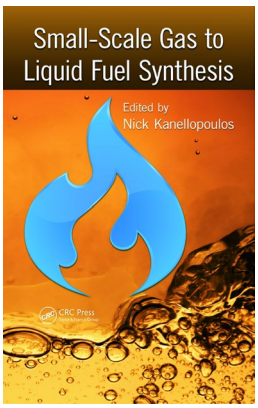


**Bibliography**
Small Scale Gas to Liquid Synthesis
Nick Kanellopoulos (Ed)
CRC Press, Boca Raton, FL, USA,
2015, pp 588, ISBN 978-1-4665-9938-3
GBP 108.00, USD 152.96

Natural gas remains the poor relation of the energy industry unless adjacent to a commercial market. Even today, if gas is discovered in a remote and inaccessible region it remains unexploited and untapped as a mainstream resource. In recent years this position has been exacerbated by the exploitation of shale gas, found so abundantly, and accessible to adjacent commercial demand. In contrast it has long been known that natural gas is the ideal feedstock for conversion by steam reforming into Syngas ($CO + 3H_2$), a mixture very efficiently converted into many chemical entities. Not least of these is conversion by the Fischer–Tropsch process into a wide variety of automotive fuels.

The basic premise is that from current estimates of "stranded" natural gas, 250 billion barrels of synthetic fuels could be manufactured. To put this quantity into perspective, it is equivalent to one-third of the Middle East's proven reserves. By combining this with the prediction that similar quantities are potentially available from stranded shale gas sources, it shines a new light on the pessimism of future oil shortages.

The editor has brought together 71 contributors and has compiled the book into three sections and 17 Chapters. Section one describes innovative membranes and sorbents; section two discusses innovative catalysts; and section three oxidative and non-oxidative processes; the whole book gives an overview of the latest developments in each of these fields and consequently only the latest technologies are discussed. The book is not a review of existing processes but an account of the high cost of the existing processes of air fractionation and Syngas production within the overall process, and includes the latest research being undertaken to resolve the cost issues. The bulk of this research has been made possible within the framework of two large European projects, targeted on the development of energy-efficient Syngas processes.

Ultimately the argument will come down to this: is it cheaper to ship 'orphan' gas by pipeline, cryogenically liquefy it at the well-head and ship by tanker, or convert into valuable chemical entities at the well-head. In the foreseeable future the answer to the latter is a resounding no if only because individual Middle East nations have the capital resources and massive amounts of negative value flare gas, thus allowing them to increase value by building million ton petrochemical cracking plants capable of supplying the world with lowest cost ethylene, propylene and their derivatives.

For those working in the field the book provides an excellent summary of the current state of the art. The question now becomes: will these very thoroughly researched data on homogeneous, heterogeneous and biocatalysts convince the cost-benefit decision-takers to take the next step?

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