

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository:<https://orca.cardiff.ac.uk/id/eprint/107743/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Chow, Ying Kit, Dummer, Nicholas , Carter, James, Meyer, Randall, Armstrong, Robert, Williams, Christopher, Shaw, Greg, Jacobs, Sara, Bhasin, Madan, Willock, David , Taylor, Stuart H. and Hutchings, Graham John 2018. A kinetic study of methane partial oxidation over FeZSM-5 using N₂O as an oxidant. *ChemPhysChem* 19 (4) , pp. 402-411. 10.1002/cphc.201701202

Publishers page: <http://dx.doi.org/10.1002/cphc.201701202>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



Supplemental info

A kinetic study of methane partial oxidation over FeZSM-5 using N₂O as an oxidant

Ying Kit Chow^a, Nicholas F. Dummer^{a*}, James H. Carter^a, Randall J. Meyer^b, Robert D. Armstrong^a, Christopher Williams^a, Greg Shaw^a, Sara Yacob^b, Madan M. Bhasin^c, David J. Willock^a, Stuart H. Taylor^a, and Graham J. Hutchings^{a*}

^a Cardiff Catalysis Institute, School of chemistry, Cardiff University, Main Building, Park Place, Cardiff, CF10 3AT, UK.

^b ExxonMobil Research and Engineering, Corporate Strategic Research, Annandale, NJ 08801, USA

^c Innovative Catalytic Solutions, LLC, Charleston, WV, 25314, USA.

* Corresponding author emails: dummernf@cardiff.ac.uk and hutch@cardiff.ac.uk

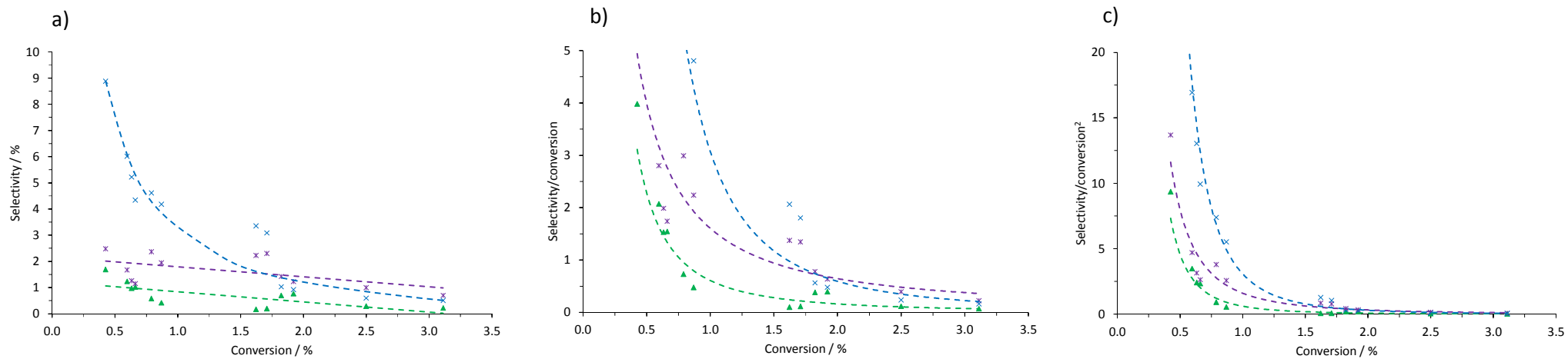


Fig. S1. First rank (a), second rank (b) and third rank (c) delplots of minor products taken from data collected over a series of experiments using different masses of 2% Fe-ZSM-5 at 300 °C; (\blacktriangle) CH_3OH , (\ast) C_2H_6 and (\times) C_2H_4 .

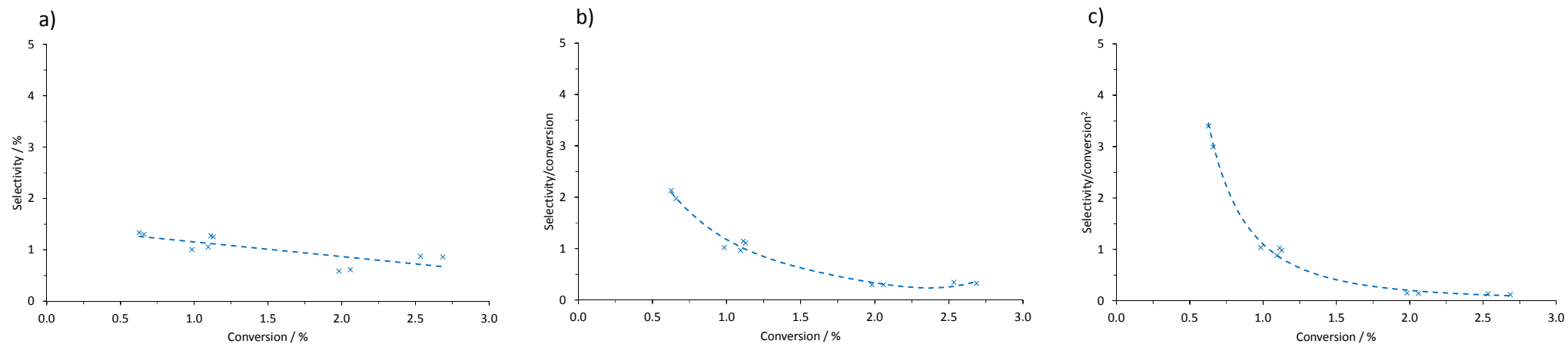


Fig S2. First rank (a), second rank (b) and third rank (c) delplots of minor products taken from data collected over a series of experiments using different masses of 2 % Fe-ZSM-5 at 300 °C with water in the feed; (X) C₂H₄.

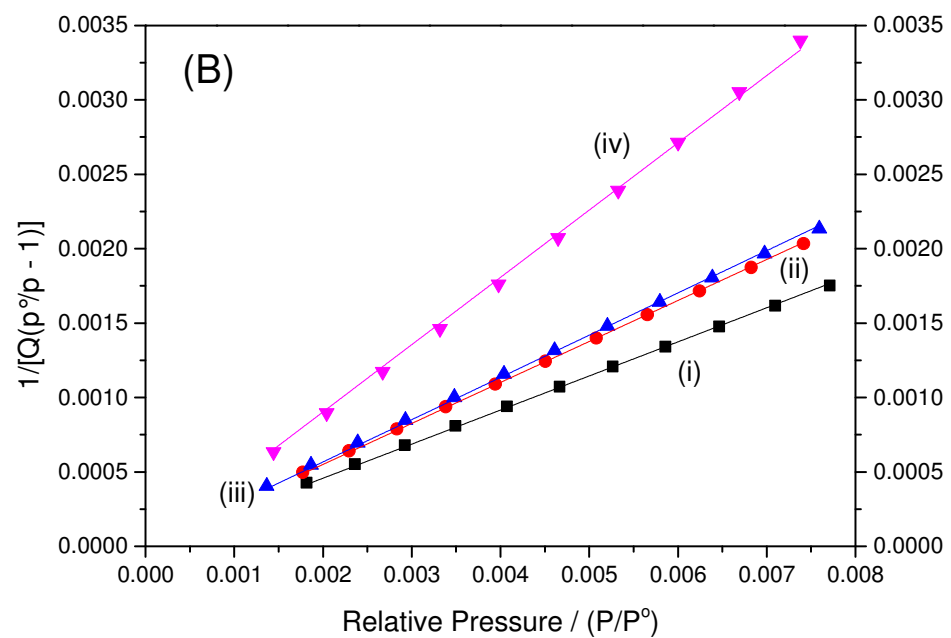
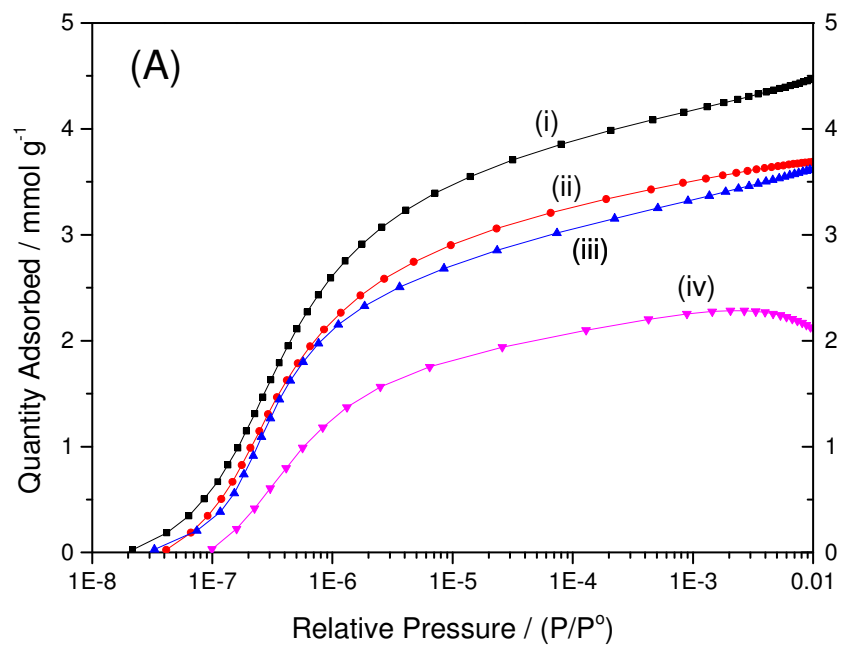


Fig. S3 N₂ adsorption isotherms (A) and BET surface area plots (B) for: (i) H-ZSM-5, (ii) Fe-ZSM-5, (iii) Fe-ZSM-5-20% and (iv) Fe-ZSM-5-0% following testing at 300 °C for 3 h.