

SUPPORTING INFORMATION FOR

***Does the rate of competing isomerisation during
alkene metathesis depend on pre-catalyst initiation rate?***

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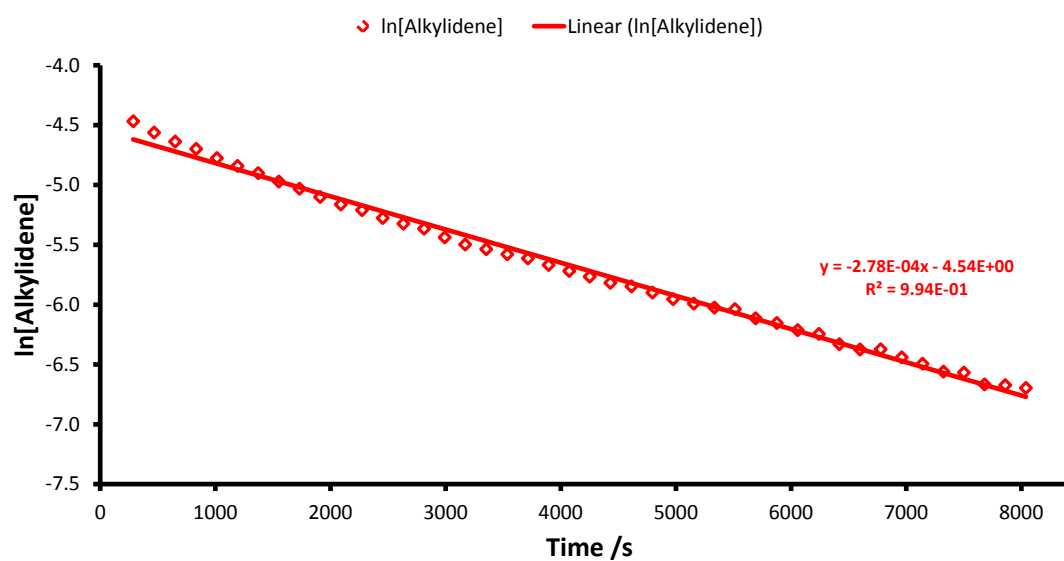
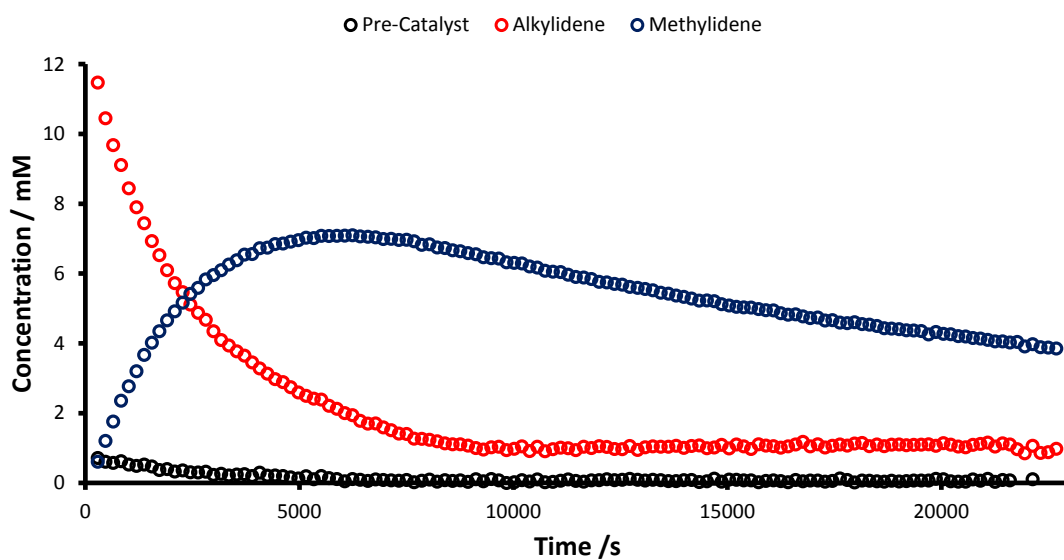
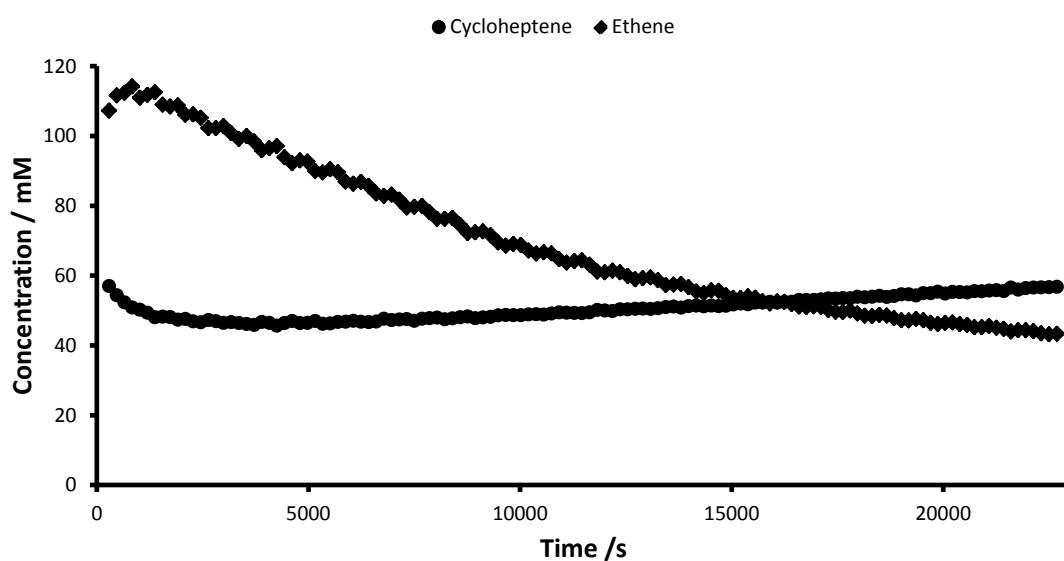
General Experimental

Kinetic data were acquired using a Bruker Avance II spectrometer (600 MHz ^1H observe frequency), equipped with TBI-z probe (inverse $^1\text{H}/^{13}\text{C}/\text{BB}$) and temperature control. All kinetic experiments were acquired at 298 K, with an interpulse delay of 35 s to ensure accurate quantification; relaxation times for signals corresponding to many components in the reaction mixtures are known to be up to *ca.* 7 s.¹ Data were processed using Bruker Topspin (version 2.1 or 3.0) and Microsoft Excel (2007 or 2010).

Complexes **G1**, **G2** and **GH2** were purchased from Sigma Aldrich and used as supplied. **Zhan1B** and **Grela2** were purchased from Strem. **M8₅₃-SIPr** was supplied by Omega Cat System (Rennes, France). Benzene-*d*₆, chloroform-*d* and toluene-*d*₈ were purchased from Sigma Aldrich, and dichloromethane-*d*₂ was purchased from Goss Scientific. Deuterated solvents were dried on activated 4 Å molecular sieves overnight and degassed with a stream of nitrogen or argon, unless otherwise stated. 1,8-Nonadiene was purchased from Sigma Aldrich and passed through a pad of activated alumina before use.

Kinetic Data Plots

1,8-nonadiene 3 mol% G1 benzene-*d*₆ (Figure 1)

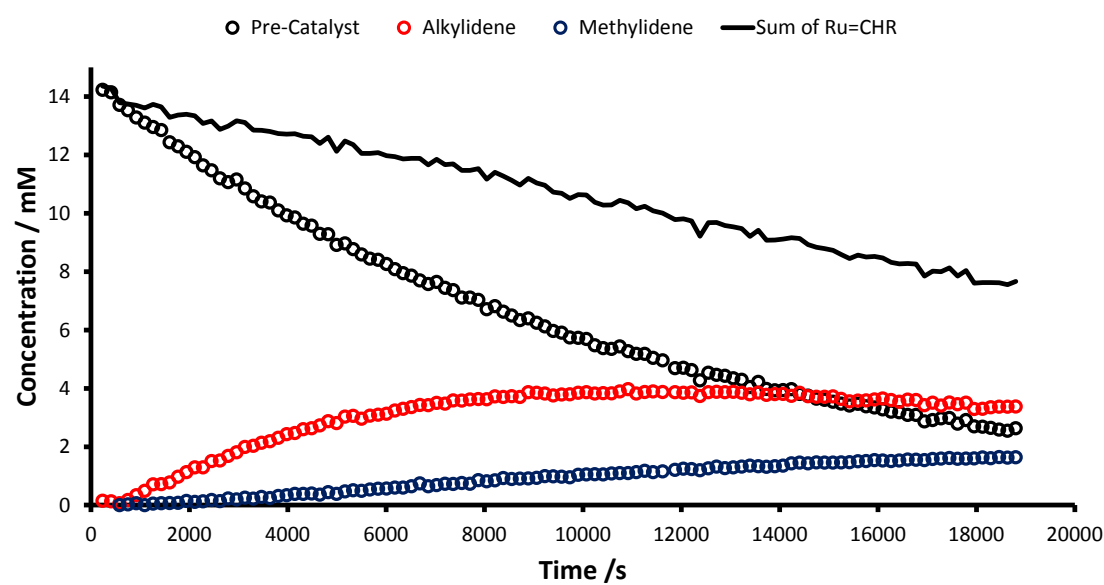
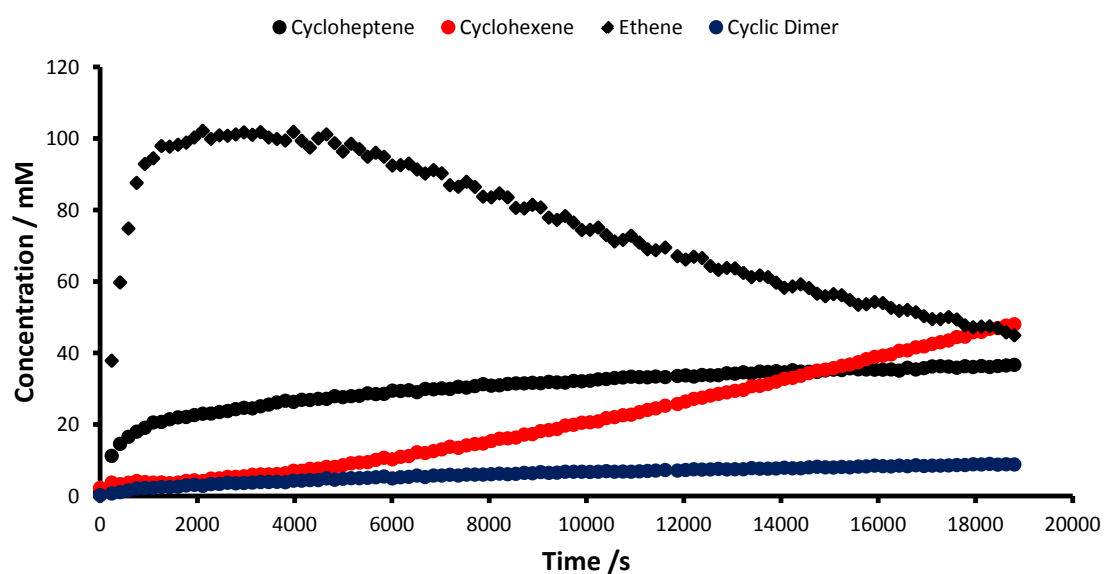


1,8-nonadiene

3 mol% G2

benzene-*d*₆

(Figure 2)

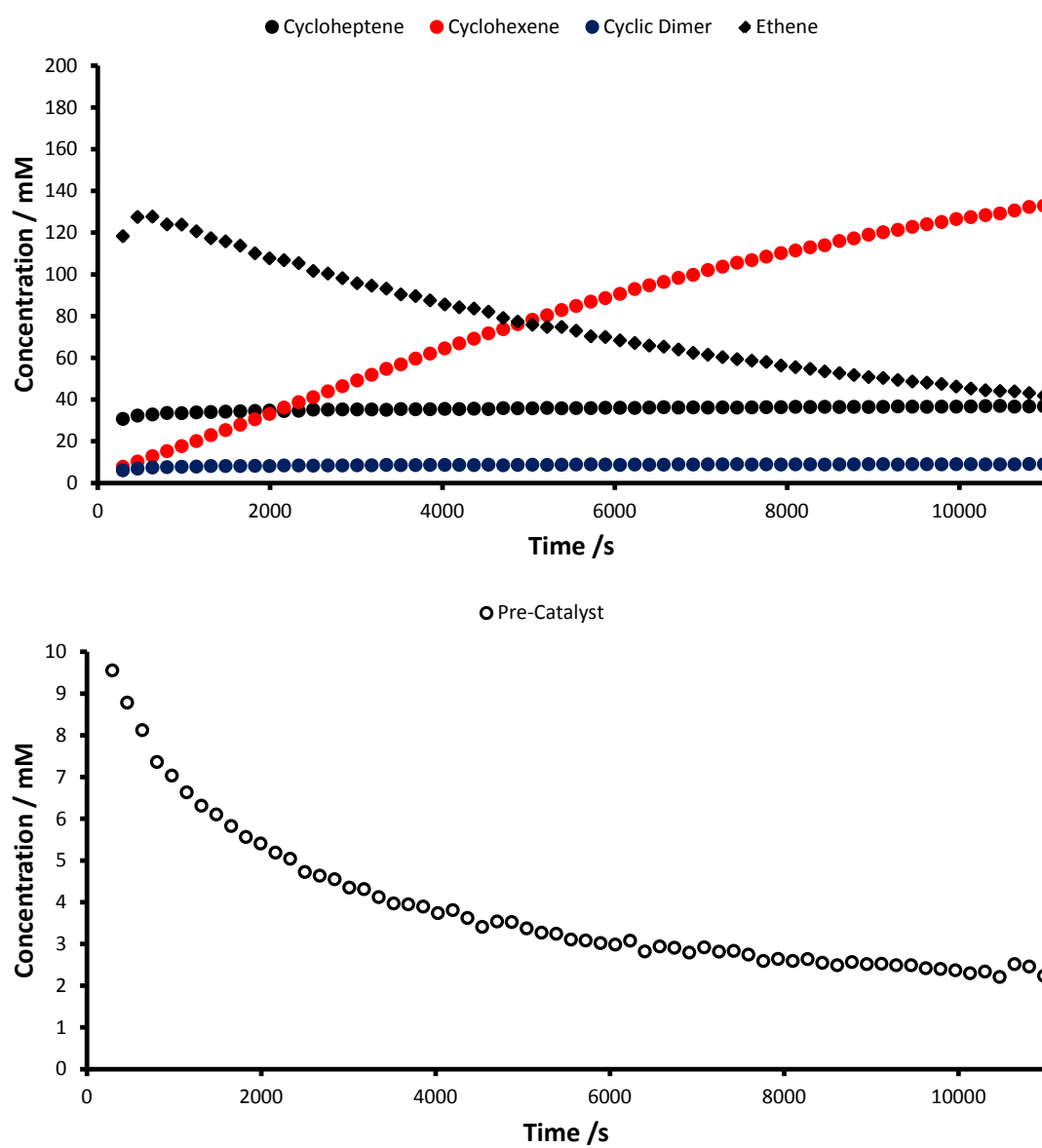


1,8-nonadiene

3 mol% GH2

benzene-*d*₆

(Figure 3)

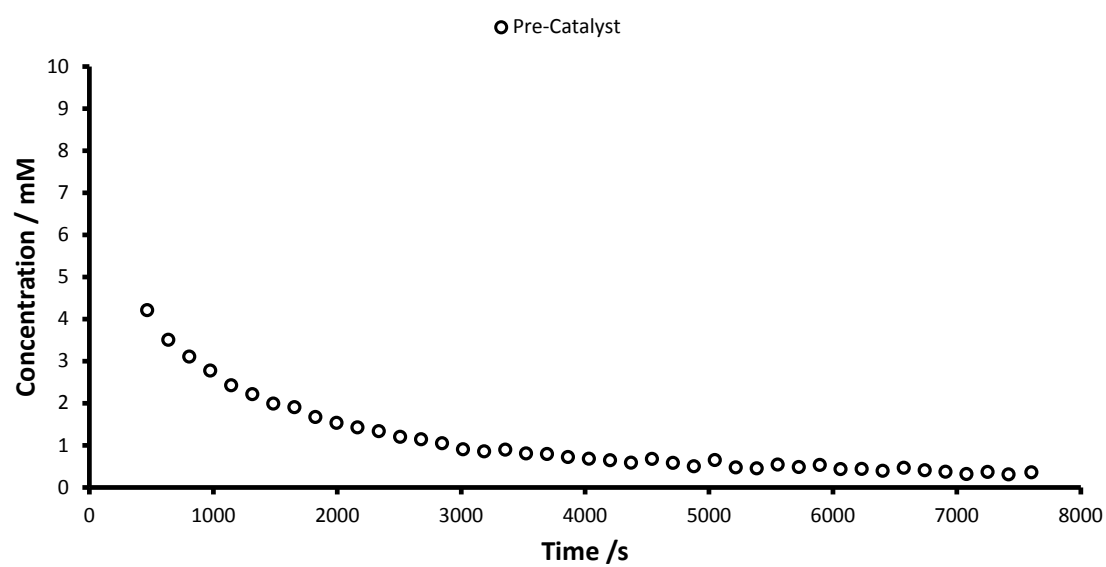
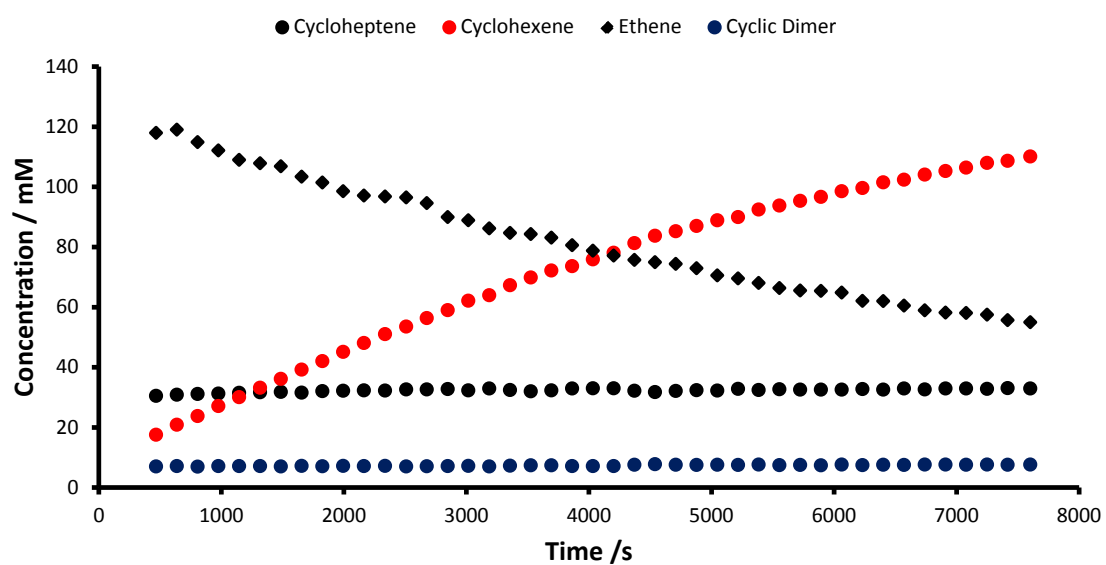


1,8-nonadiene

3 mol% **Zhan1B**

benzene-*d*₆

(Figure 3)

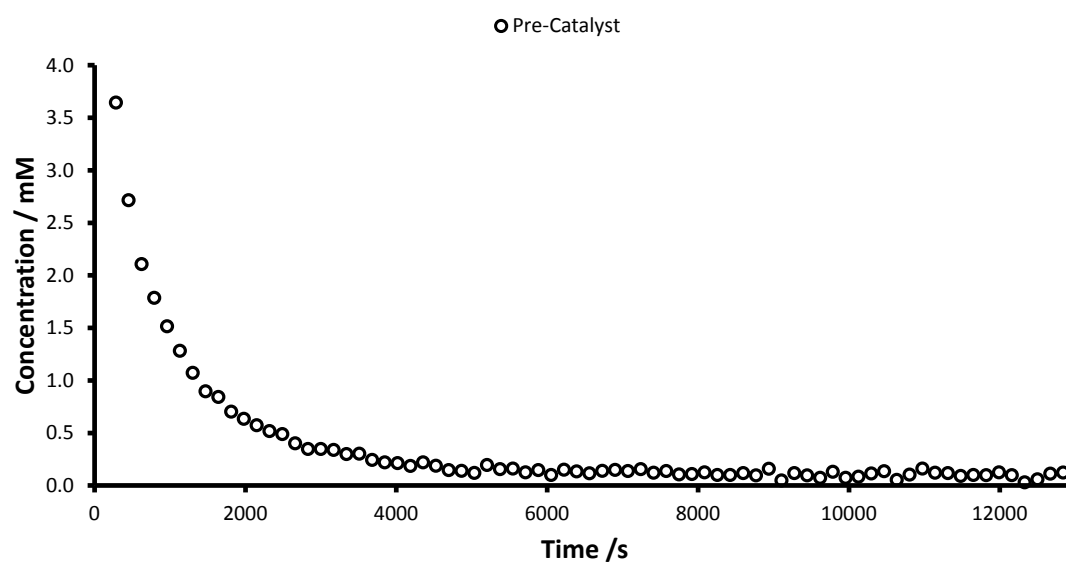
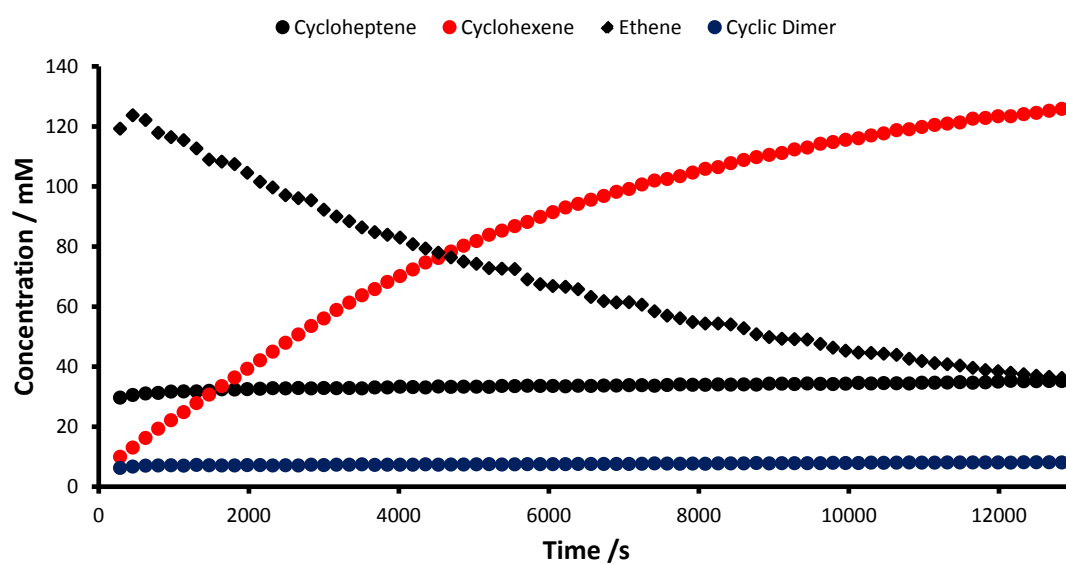


1,8-nonadiene

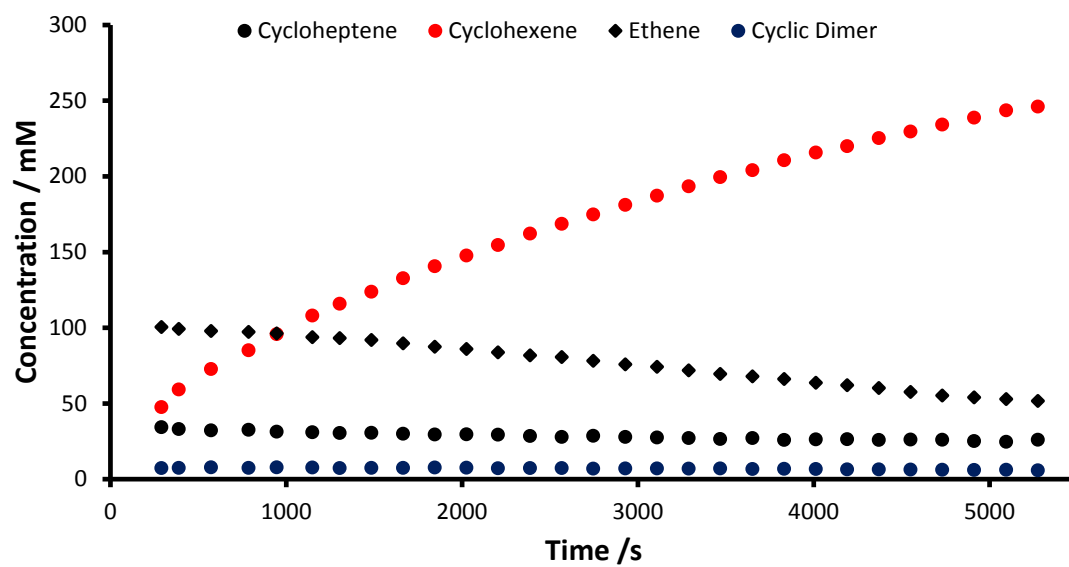
3 mol% **Grela2**

benzene-*d*₆

(Figure 3)



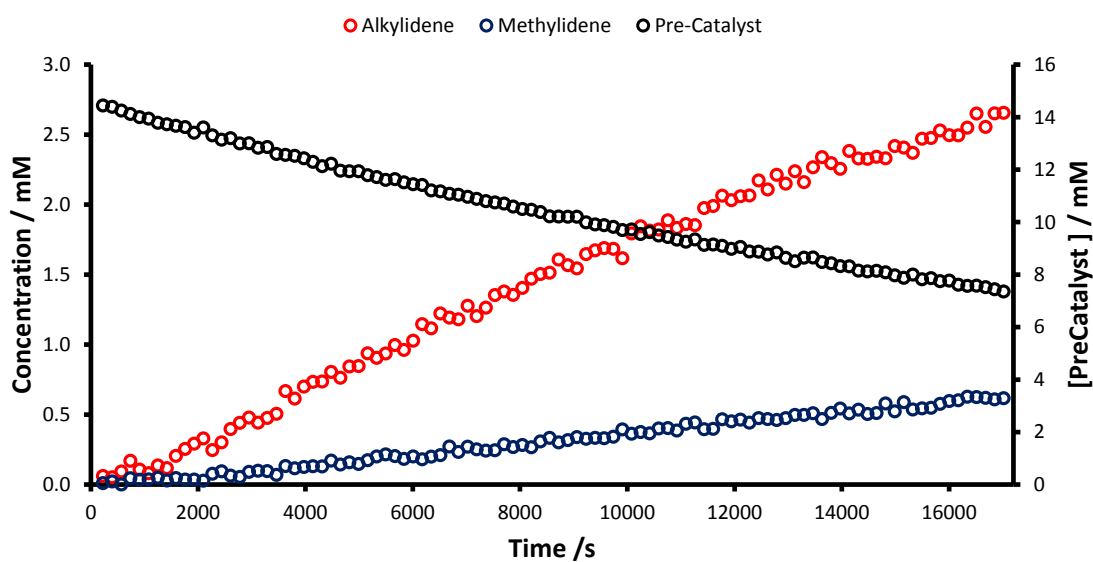
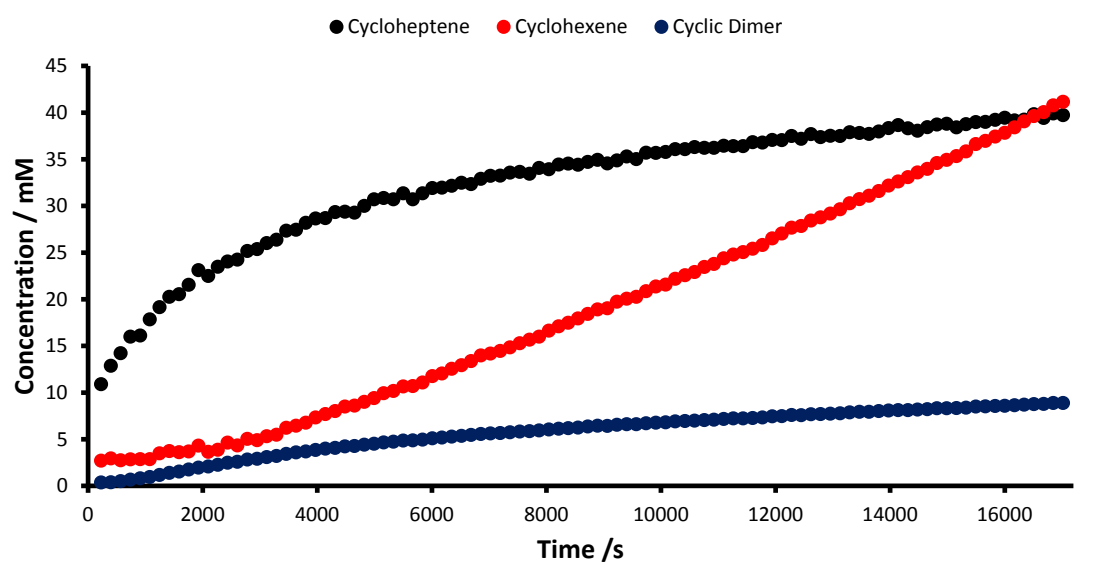
1,8-nonadiene 3 mol% M_{853} -SIPr benzene- d_6 (Figure 4)



1,8-nonadiene

3 mol% G2

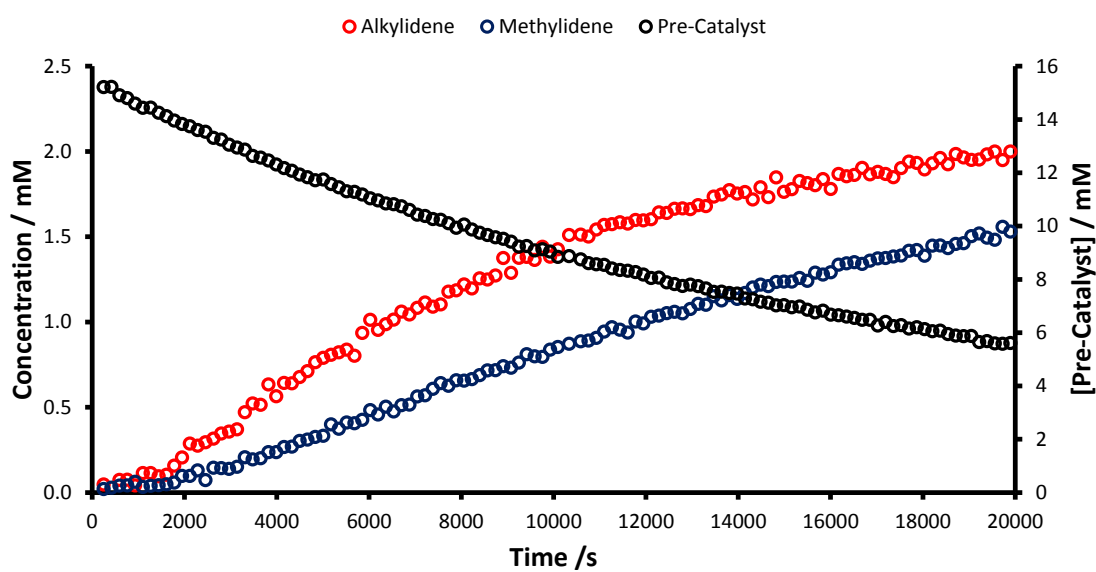
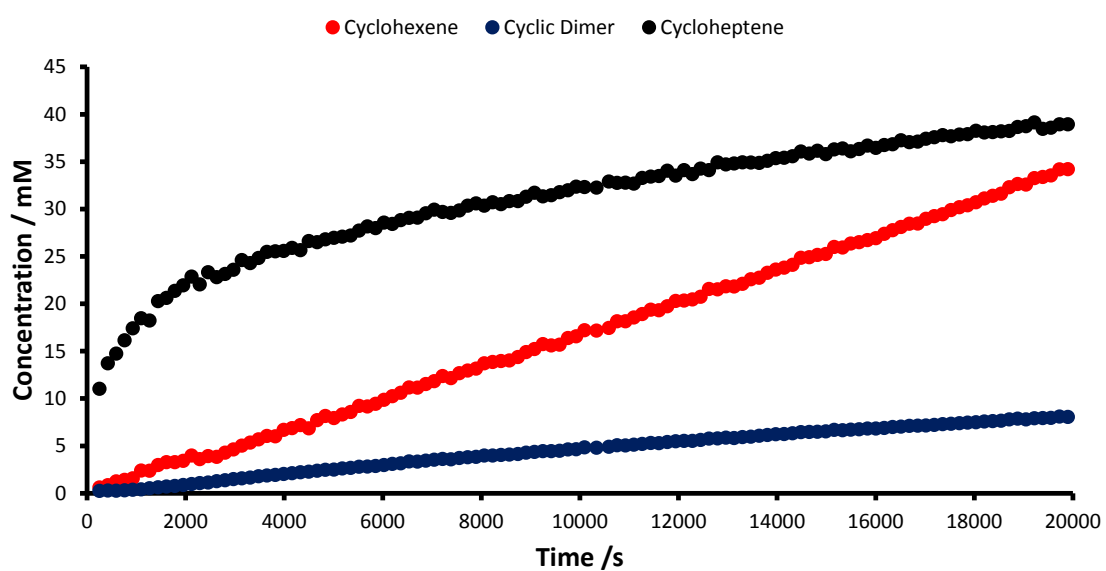
chloroform-*d* (Figure 5)



1,8-nonadiene

3 mol% G2

undried chloroform-*d*

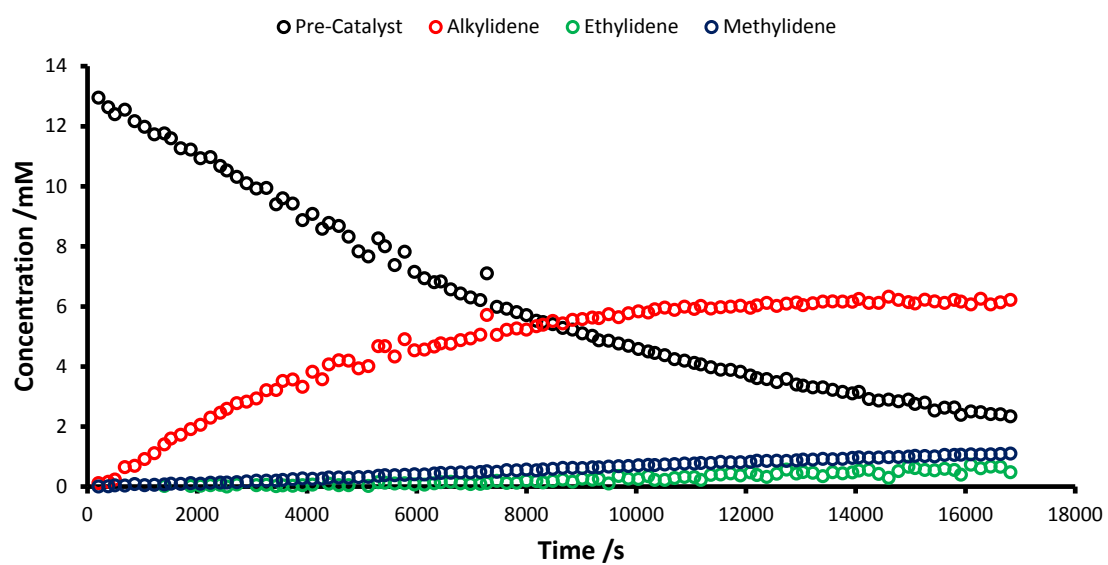
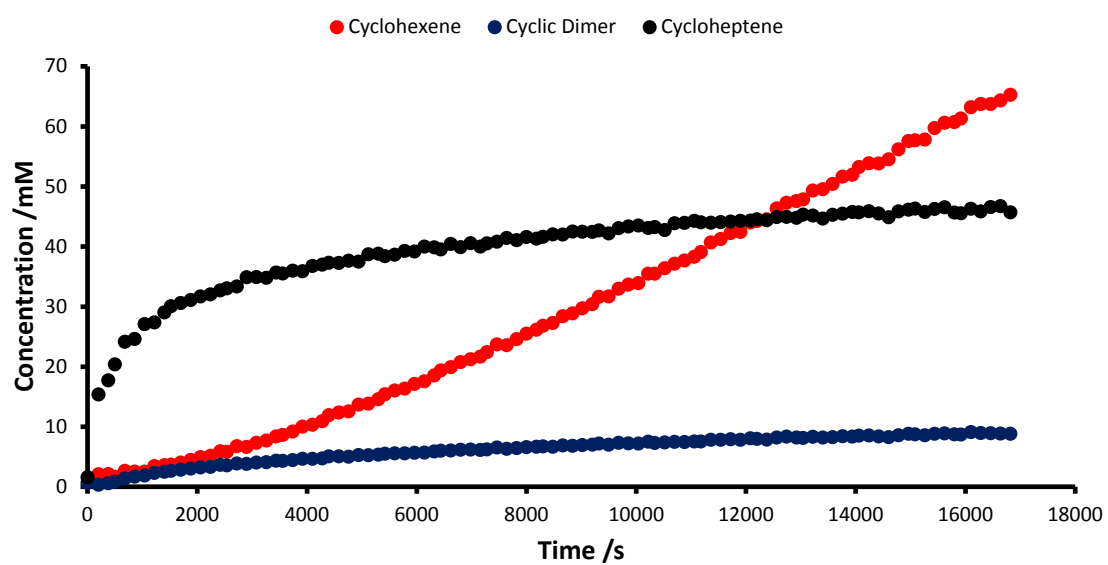


1,8-nonadiene

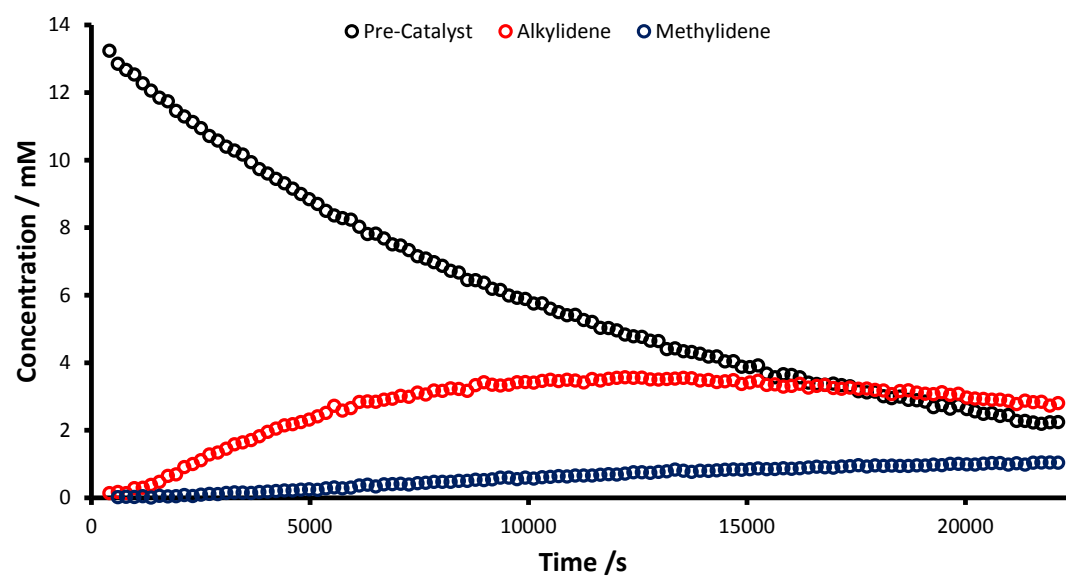
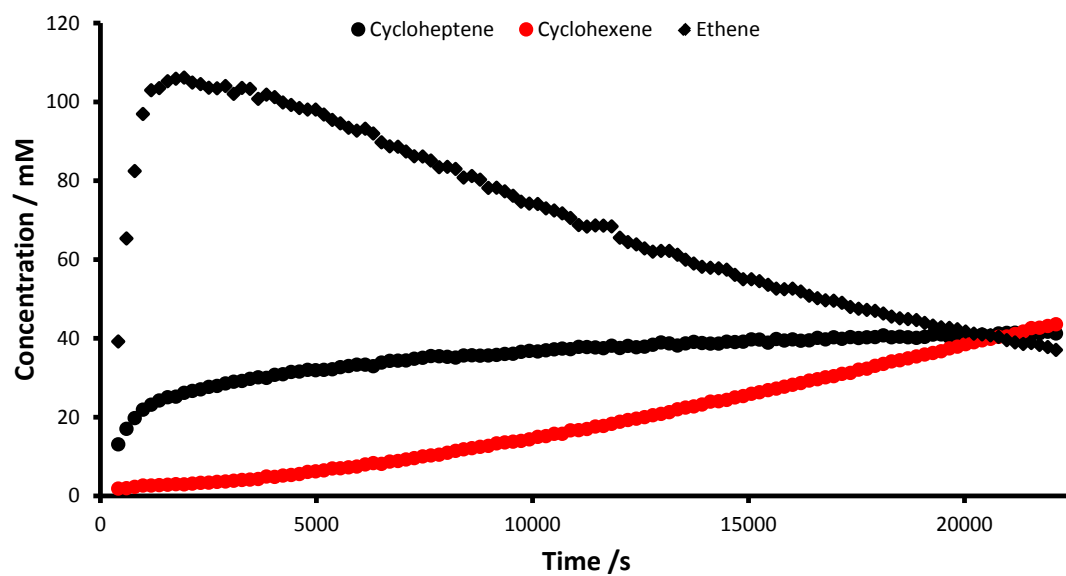
3 mol% G2

DCM- d_2

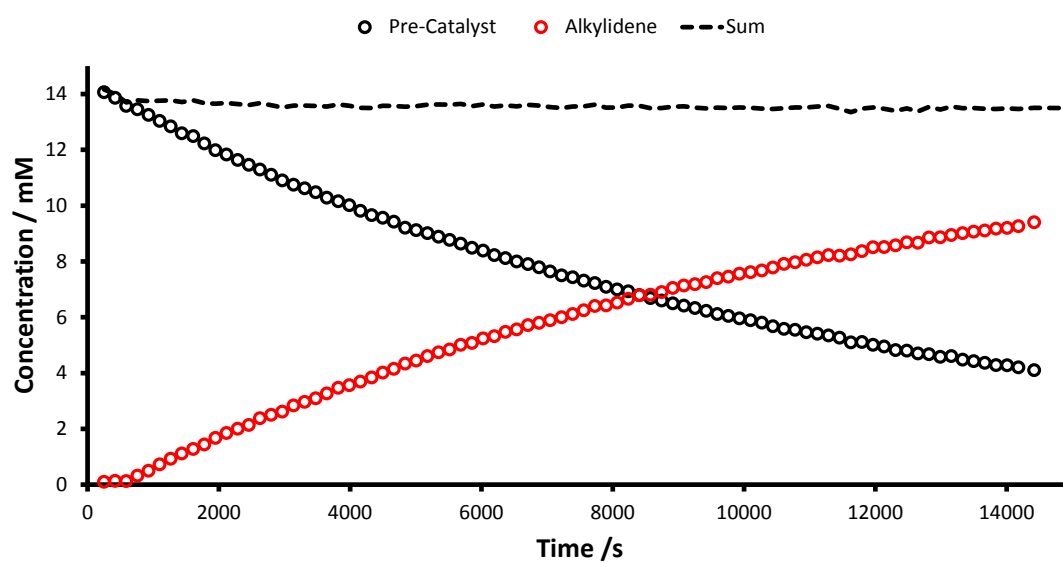
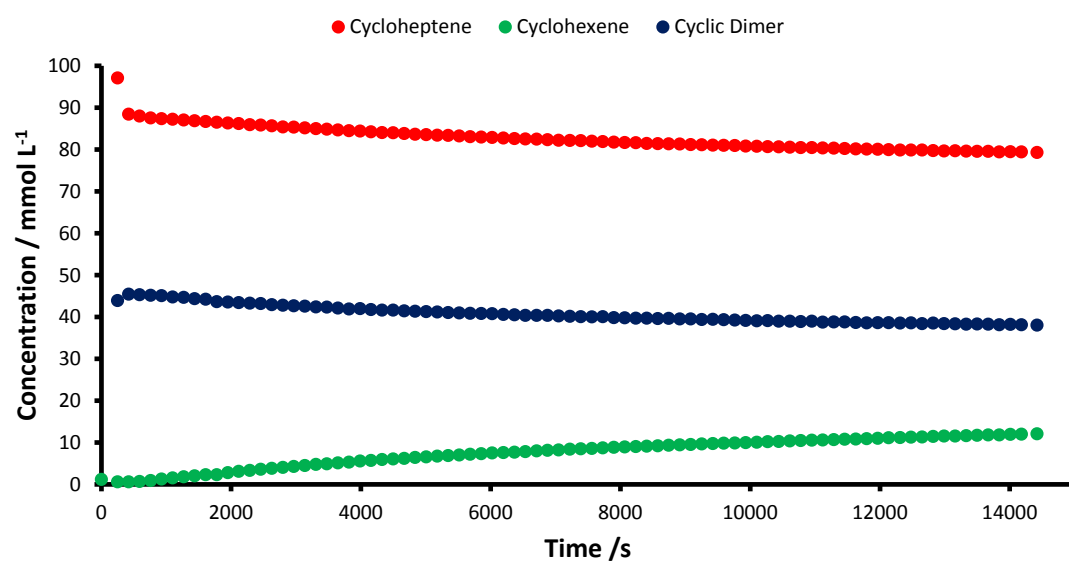
(Figure 5)



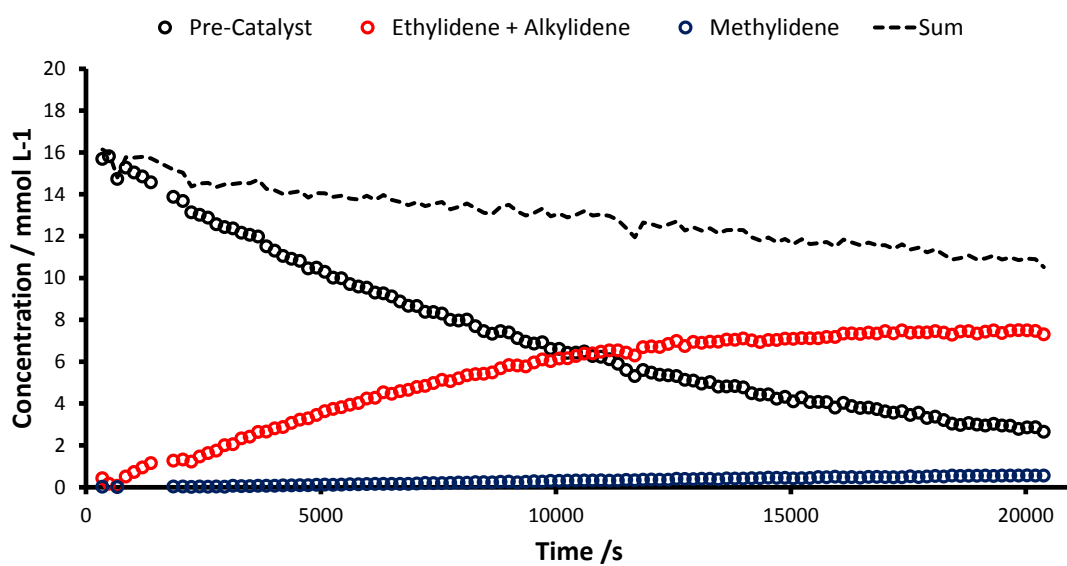
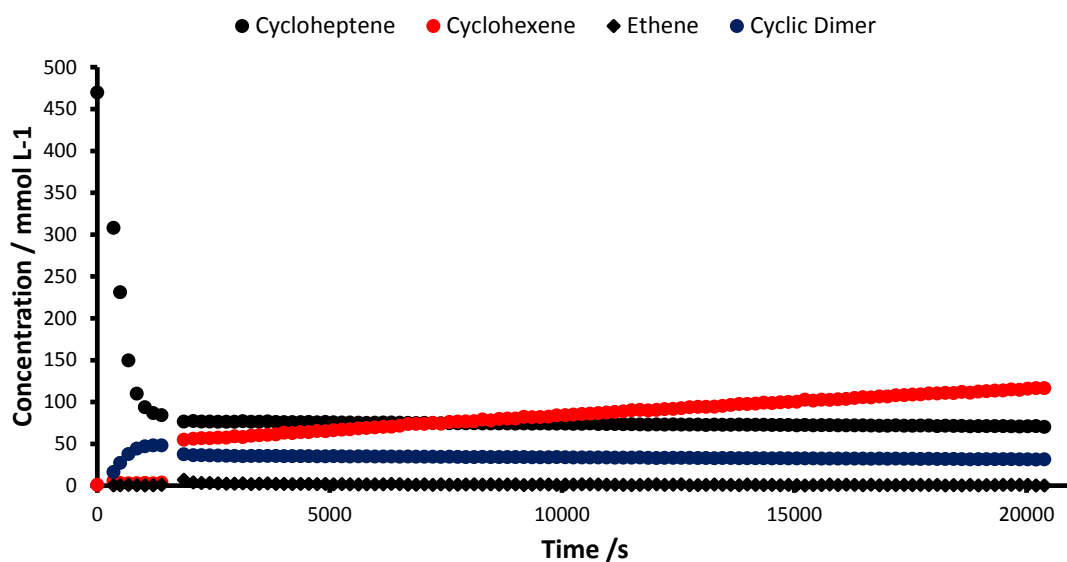
1,8-nonadiene 3 mol% G2 toluene- d_8 (Figure 5)



Cycloheptene 3 mol% G2 benzene-*d*₆ (Figure 6)



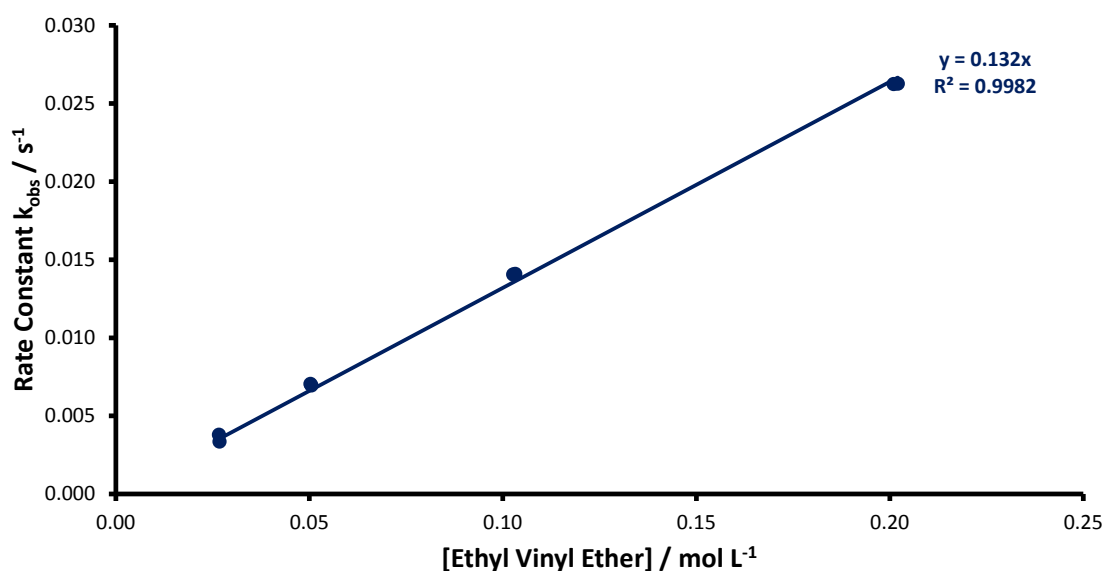
Cycloheptene/1,7-octadiene 3 mol% G2 benzene- d_6



Initiation Rate Measurement for Zhan1B

The initiation rate for this complex was determined by monitoring the reaction of the pre-catalyst with ethyl vinyl ether in DCM solution at 298 K using UV/visible spectroscopy, using the same apparatus and method used for the determination of the initiation rate constants for complexes **GH2**² and **Grela2**.³

[ethyl vinyl ether] / mol L ⁻¹	k_{obs} / s ⁻¹
0.02676	0.00336
0.02662	0.00379
0.05055	0.00695
0.05029	0.00705
0.10320	0.01409
0.10267	0.01405
0.20205	0.02626
0.20101	0.02624



References

1. I. W. Ashworth, D. Carboni, I. H. Hillier, D. J. Nelson, J. M. Percy, G. Rinaudo and M. A. Vincent, *Chem. Commun.*, 2010, **46**, 7145-7147.
2. I. W. Ashworth, I. H. Hillier, D. J. Nelson, J. M. Percy and M. A. Vincent, *Chem. Commun.*, 2011, **47**, 5428-5430.
3. D. J. Nelson, P. Queval, M. Rouen, M. Magrez, L. Toupet, F. Caijo, E. Borré, I. Laurent, C. Crévisy, O. Baslé, M. Mauduit and J. M. Percy, *ACS Catal.*, 2013, **3**, 259-264.