

Formation of ZrC–SiC Composites from the Molecular Scale through the Synthesis of Multielement Polymers

Fabien Bouzat ¹, Romain Lucas ^{1,*}, Yann Leconte ², Sylvie Foucaud ¹, Yves Champavier ³, Cristina Coelho Diogo ⁴, and Florence Babonneau ⁵

¹ IRCER, Université de Limoges, UMR 7315, F-87068 Limoges, France; fbo@shimadzu.fr (F.B.: Fabien Bouzat); sylvie.foucaud@unilim.fr (S.F.)

² NIMBE, CNRS, CEA, Université Paris-Saclay, 91191 Gif-sur-Yvette, France; yann.leconte@cea.fr

³ Service de RMN, BISCEM (US042 INSERM - UMS 2015 CNRS), CBRS, 2 rue Bernard Descottes, F-87025 Limoges, France; yves.champavier@unilim.fr

⁴ Institut des Matériaux de Paris-Centre, CNRS, Sorbonne Université, FR2482, F-75005 Paris, France; cristina.coelho@upmc.fr

⁵ Laboratoire de Chimie de la Matière Condensée de Paris, CNRS, Sorbonne Université, LCMCP, F-75005 Paris, France; florence.babonneau@sorbonne-universite.fr (F.B.: Florence Babonneau)

* Correspondence: romain.lucas@unilim.fr; Tel.: +33587502350

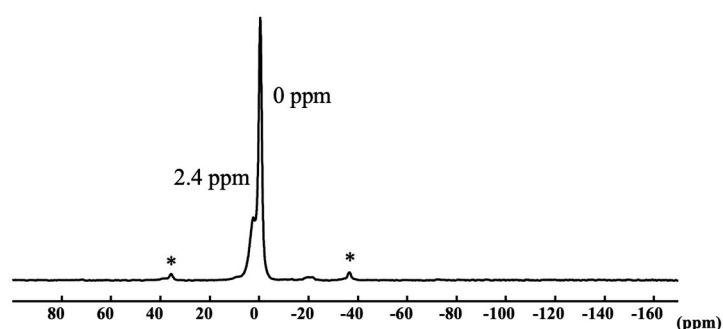


Figure S1. ²⁹Si CP-MAS NMR spectrum of *l*-cPCS.

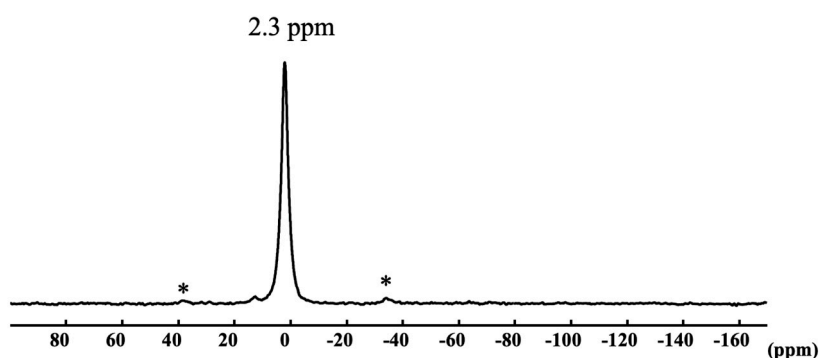


Figure S2. ²⁹Si CP-MAS NMR spectrum of *hb*-cPCS.

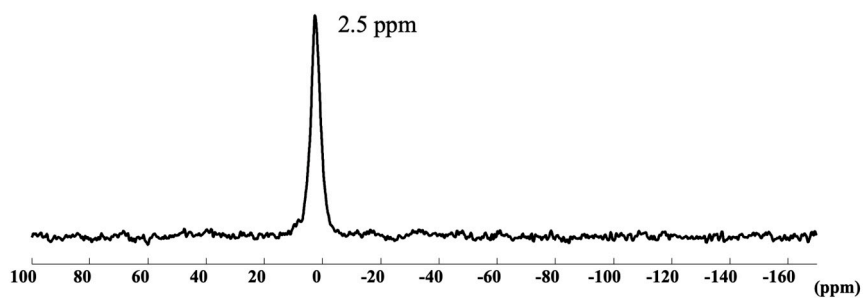


Figure S3. ^{29}Si CP-MAS NMR spectrum of *hb-cPZCS*.

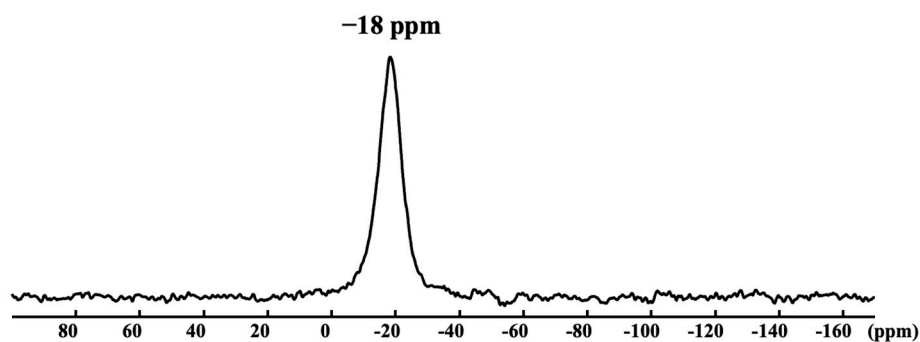


Figure S4. ^{29}Si CP-MAS NMR spectrum of *l-hPCS*.

Table S1. Average bond enthalpy at 298 K.

Bond	Average bond enthalpy (kJ.mol ⁻¹)
N–N	159
Si–C	289
C–N	293
C–C	347
N=N	418
C=C	615

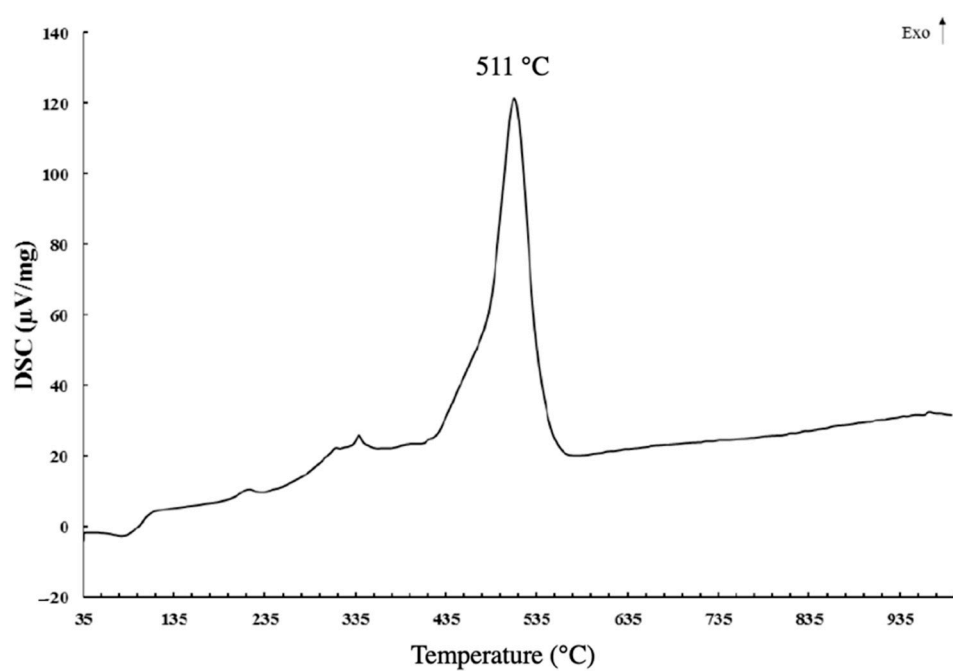


Figure S5. DSC of *l*-cPCS (Exo = exothermic)

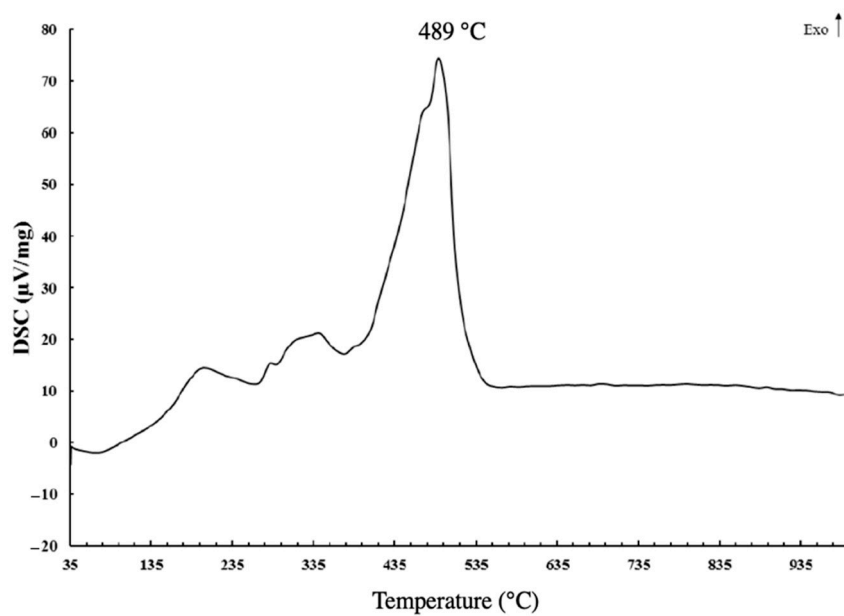


Figure S6. DSC of *hb*-cPCS (Exo = exothermic).

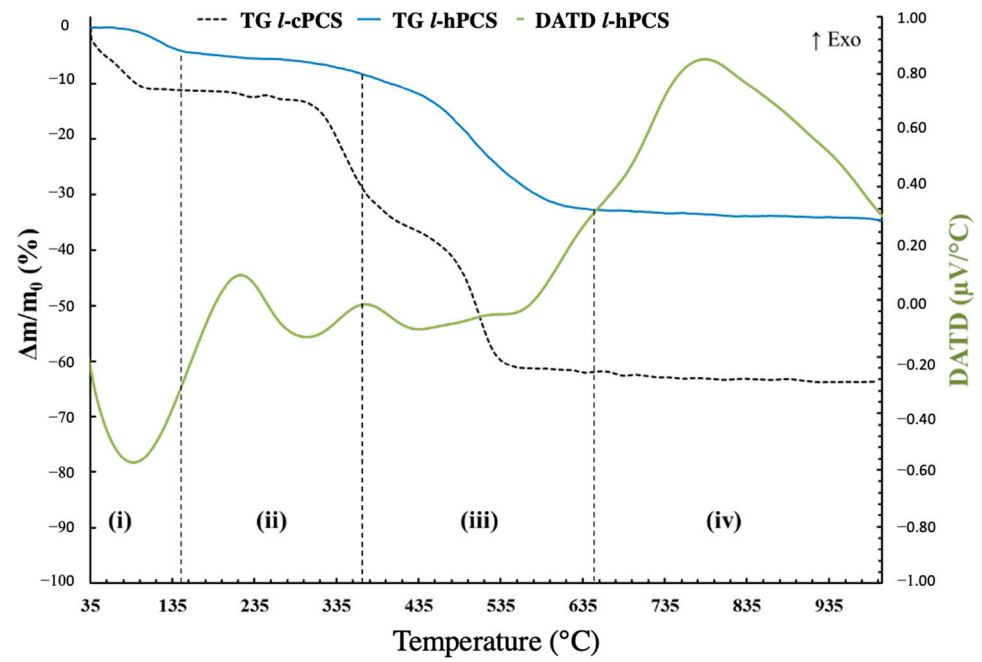


Figure S7. TG profiles of *l*-cPCS and *l*-hPCS and DATD of *l*-hPCS.

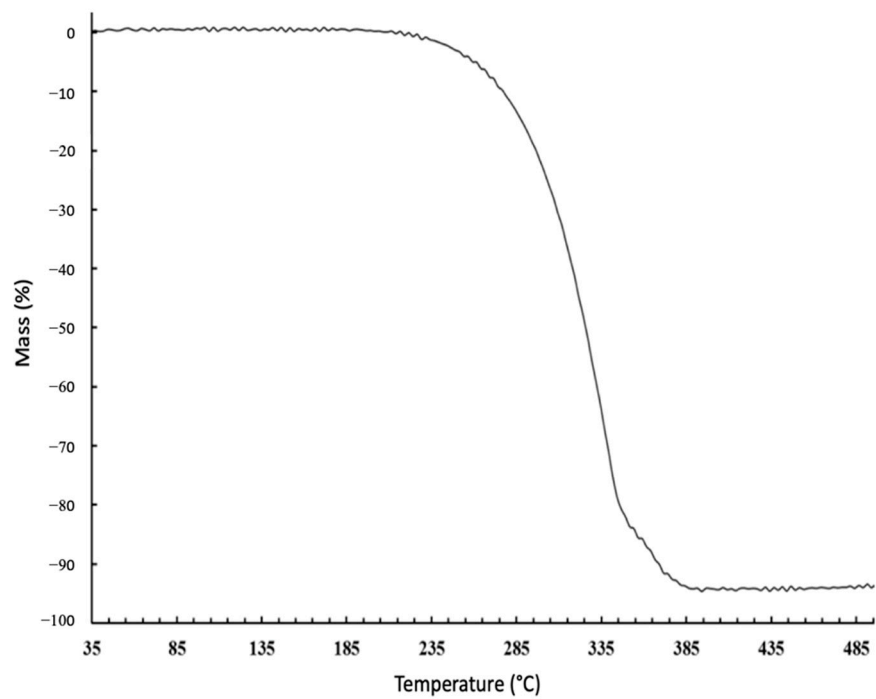
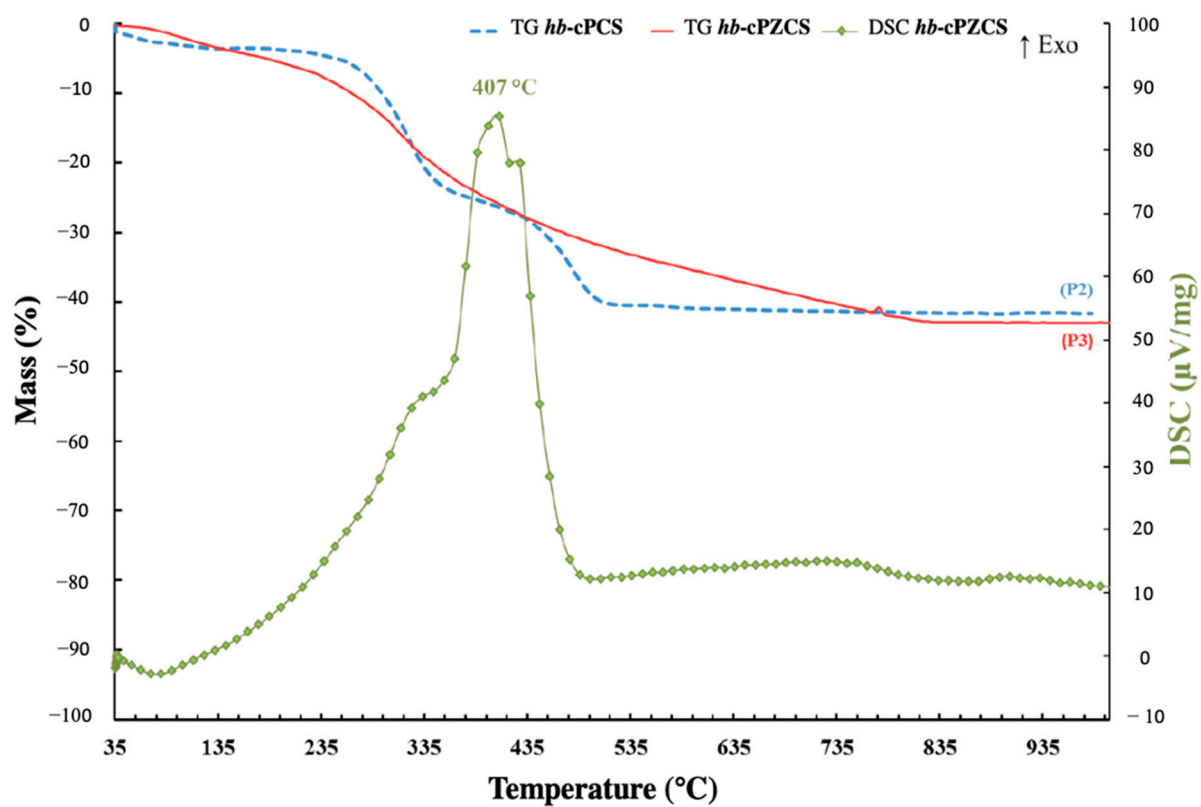


Figure S8. TG profile of ZrCp₂Cl₂.Figure S9. TG profiles of *hb-cPCS* and *hb-cPZCS* and DSC of *hb-cPZCS* (Exo = exothermic).

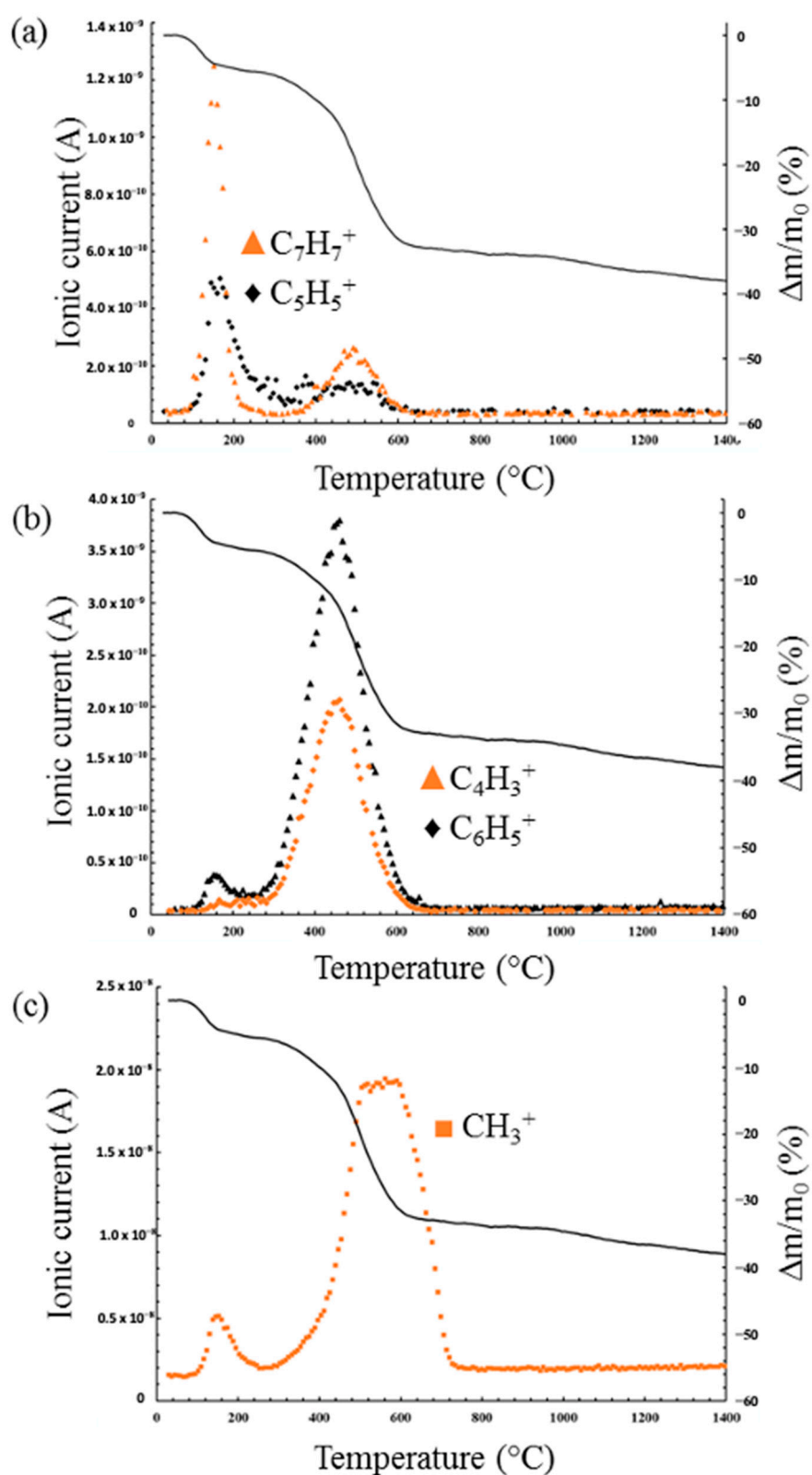


Figure S10. Mass spectrometry of the gaseous species released during the pyrolysis of *l*-hPCS.

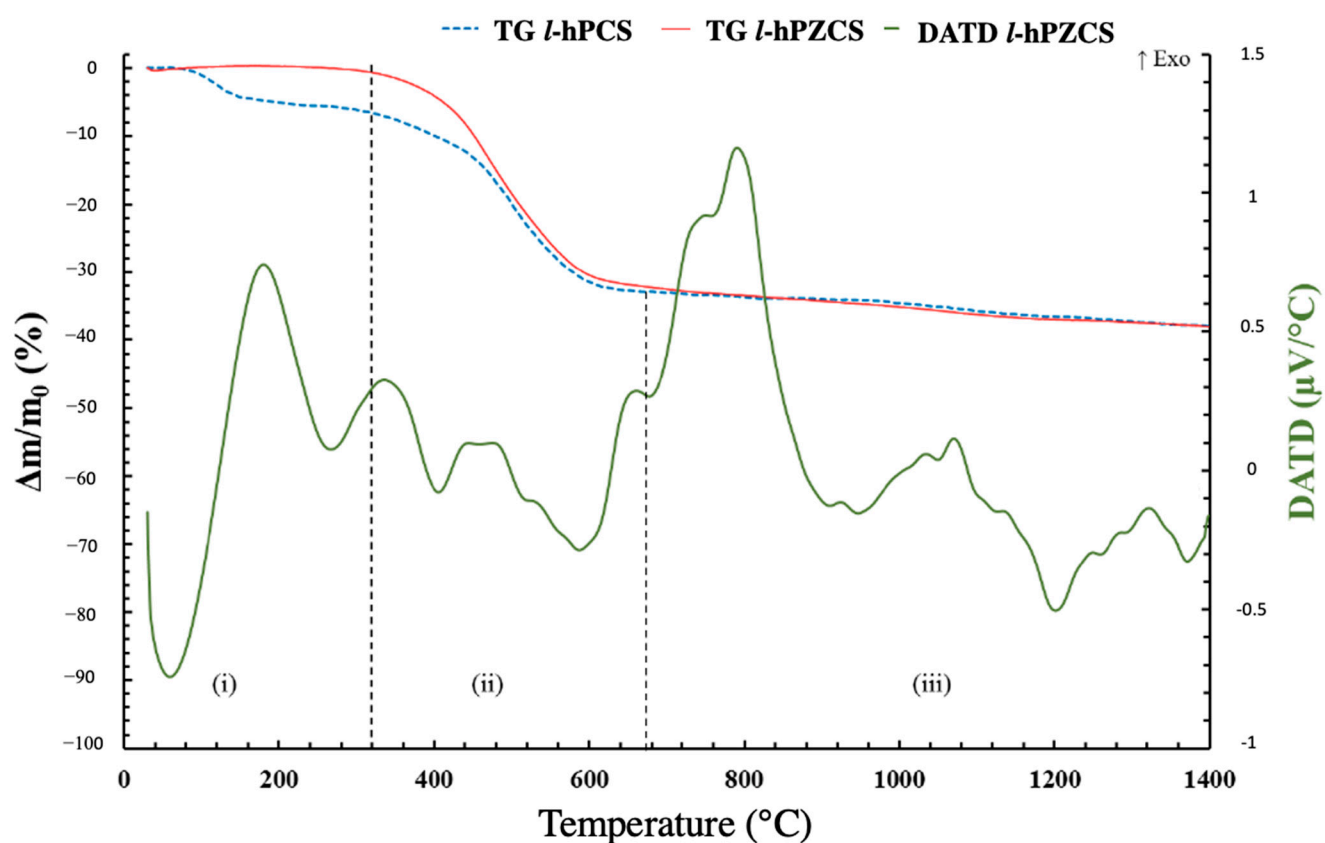


Figure S11. TG profiles of *l*-hPCS and *l*-hPZCS and DATD of *hb*-cPZCS (Exo = exothermic).

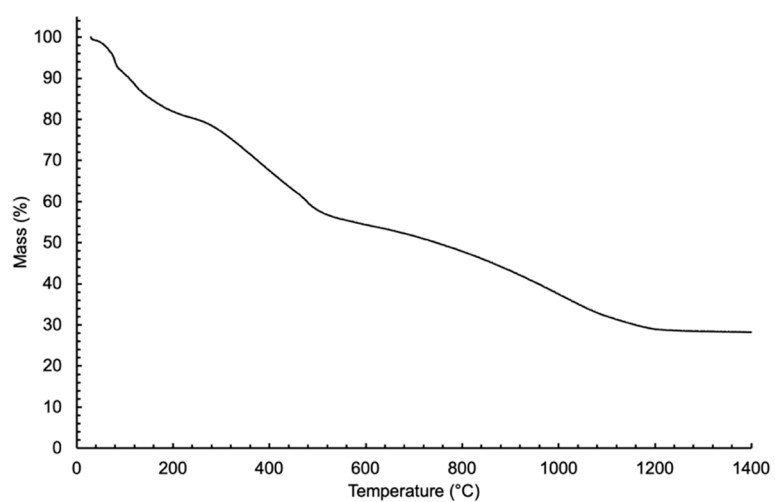


Figure S12. TG profile of ZrCp₂H₂.

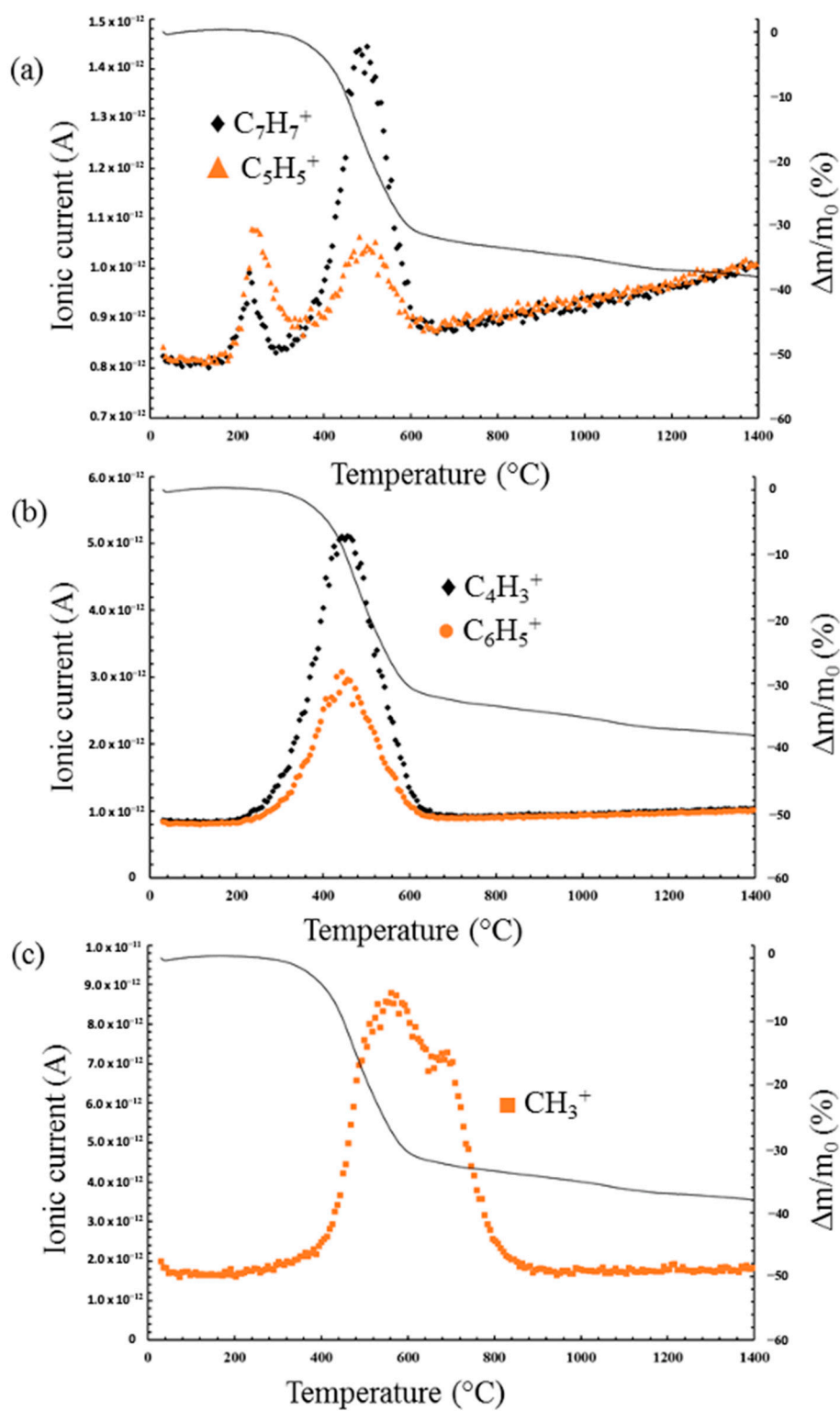


Figure S13. Mass spectrometry of the gaseous species released during the pyrolysis of *l*-hPZCS.