Support Information

High-pressure thermal decomposition of tetrahydrotricyclopentadiene (THTCPD) and binary high-density hydrocarbon fuels of JP-10/THTCPD in tubular flowing reactor

Xueke Jia[a†], Baoman Guo[a†], Baitang Jin[a], Xiangwen Zhang[a,b], Kai Jing[a], Guozhu Liu[a,b]*

(a. Key Laboratory for Green Chemical Technology of Ministry of Education, School of Chemical Engineering and Technology, Tianjin University, Tianjin 300072, China;

b. Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Tianjin University, Tianjin 300072, China)

[†]These authors contributed equally to this work and should be considered as co-first authors.

*Telephone/Fax: +86-22-85356099. E-mail: gliu@tju.edu.cn.

High-pressure thermal decomposition of THTCPD and binary high-density hydrocarbon fuels of JP-10/THTCPD were investigated at 500-660 ^{o}C and 4.0 MPa in an electrically heated tubular reactor. The overall component distribution (wt%) of liquid residuals from thermal decomposition of THTCPD, 30% JP-10/70% THTCPD and 50% JP-10/50% THTCPD are shown in **Table S1**. Due to the complex structures of both the THTCPD and their isomers were quite complex, the structures of THTCPD and their ismoers were shown in **Figure S1**. In addition, conversion of JP-10 in JP-10/THTCPD mixtures were listed in **Figure S2**.

Table Captions

Table S1 The component distribution (wt%) of liquid residuals from thermal decomposition of THTCPD and 30% JP-10/70% THTCPD and 50% JP-10/50% THTCPD (60 g/min, 4 MPa)

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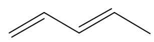
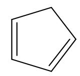
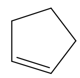
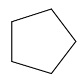
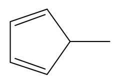
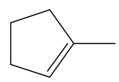
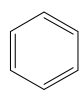
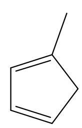
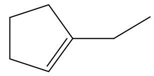
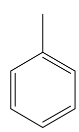
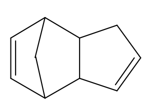
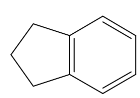
Number	Component	Structure	THTCPD	30% JP-10/70% THTCPD	50% JP-10/50% THTCPD
1	1,3-pentadiene				0.0991
2	1,3-cyclopentadiene		1.5446	1.5082	2.0227
3	cyclopentene		3.3112	3.2158	3.9455
4	cyclopentane		1.5867	1.6131	1.8763
5	5-methyl-1,3-cyclopentadiene		0.1180	0.1200	0.1360
6	1-methylcyclopentene		0.3232	0.2911	0.2965
7	benzene		1.0069	1.0981	1.3657
8	1-methyl-1,3-cyclopentadiene		0.1330	0.1436	0.1728
9	1-ethylcyclopentene		0.2801		
10	toluene		0.6201	0.7248	0.8587
11	C8		0.2819		
12	dicyclopentadiene		0.7025	0.7843	0.7693
13	indane		0.3307	0.3383	0.2974

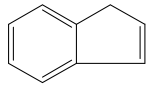
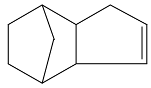
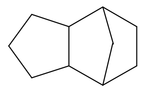
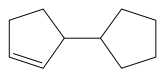
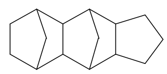
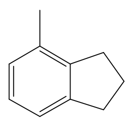
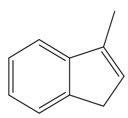
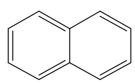
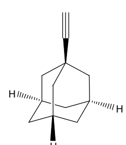
14	indene		0.3363	0.3430	0.3088
15	3a,4,5,6,7,7a-hexahydro-4,7-methanoindene		1.1568	1.0159	0.8526
16	JP-10		1.0342	29.0744	41.5249
17	3-cyclopentylcyclopentene		0.2707	0.7220	0.7324
18	endo-THTCPD				0.2403
19	2,3-dihydro-4-methyl-1*H*-indene		0.3653		
20	3-methyl-1H-indene		0.0824		
21	naphthalene		0.2201		
22	1-ethynyladamantane		0.1705		

Figure Captions

Figure S1 The structures of THTCPD and their ismoers

Figure S2 Conversion of JP-10 in JP-10/THTCPD mixtures
(■ THTCPD, ●30% JP-10/70% THTCPD, ▲50% JP-10/50% THTCPD; 4MPa)

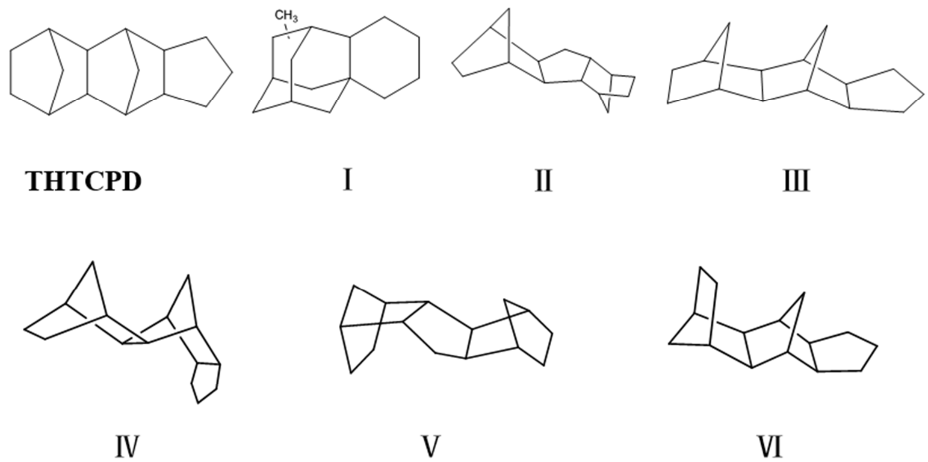


Figure S1 The structures of THTCPD and their ismoers

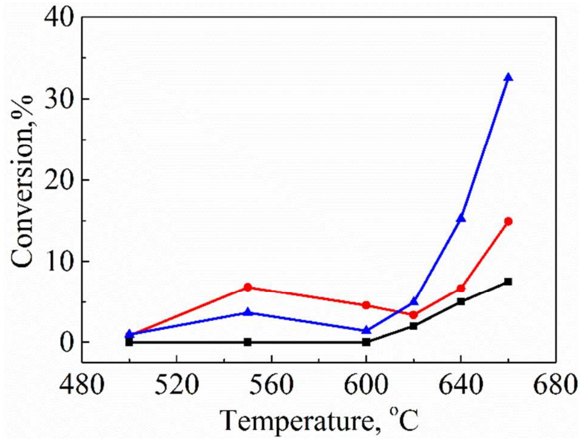


Figure S2 Conversion of JP-10 in JP-10/THTCPD mixtures

(■ THTCPD, ●30% JP-10/70% THTCPD, ▲50% JP-10/50% THTCPD; 4MPa)

The initial pathway of THTCPD pyrolysis will generate a portion of JP-10 by intermolecular C-C bond breakage. As a result, JP-10 in JP-10/THTCPD mixtures not only acted as reactants but also as products during the pyrolysis.