

Table 1 Composition and properties of SIP common gasoline surrogate mixtures

Constituent	S5R ^{a)}		S5H ^{a)}	
	vol%	mol%	vol%	mol%
isooctane (C ₈ H ₁₈) ^{b)}	29.0	23.825	31.0	24.704
<i>n</i> -heptane (C ₇ H ₁₆)	21.5	19.903	10.0	8.980
methylcyclohexane (C ₇ H ₁₄)	5.0	5.317	5.0	5.158
diisobutylene (C ₈ H ₁₆) ^{c)}	14.0	12.125	14.0	11.761
toluene (C ₇ H ₈)	30.5	38.830	40.0	49.397
Property				
RON	90.8		100.2	
MON	82.9		88.8	
HHV [MJ/kg]	45.41		45.14	
LHV [MJ/kg]	42.49		42.43	

^{a)} "S5R" and "S5H" stand for SIP five-component surrogate for "regular" (JIS 2nd grade) and "high-octane" (JIS 1st grade) gasolines.

^{b)} 2,2,4-trimethylpentane.

^{c)} Approximately 4:1 mixture of 2,4,4-trimethyl-1-pentene and 2,4,4-trimethyl-2-pentene.

Table 2 Properties of components

Constituent	boiling point [°C]	RON	MON	density [g/cm ³]	formula weight
isooctane (C ₈ H ₁₈)	98	100	100	0.692	114.23
<i>n</i> -heptane (C ₇ H ₁₆)	98	0	0	0.684	100.20
methylcyclohexane (C ₇ H ₁₄)	101	74.8	73.8	0.77	98.19
diisobutylene (C ₈ H ₁₆)	101	96	82	0.7166	112.21
toluene (C ₇ H ₈)	110	120	109	0.865	92.14

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