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Electronic Supplementary Information

Preparation and characterization of room temperature vulcanized silicone rubber using α-amine ketoximesilanes as auto-catalyzed cross-linkers

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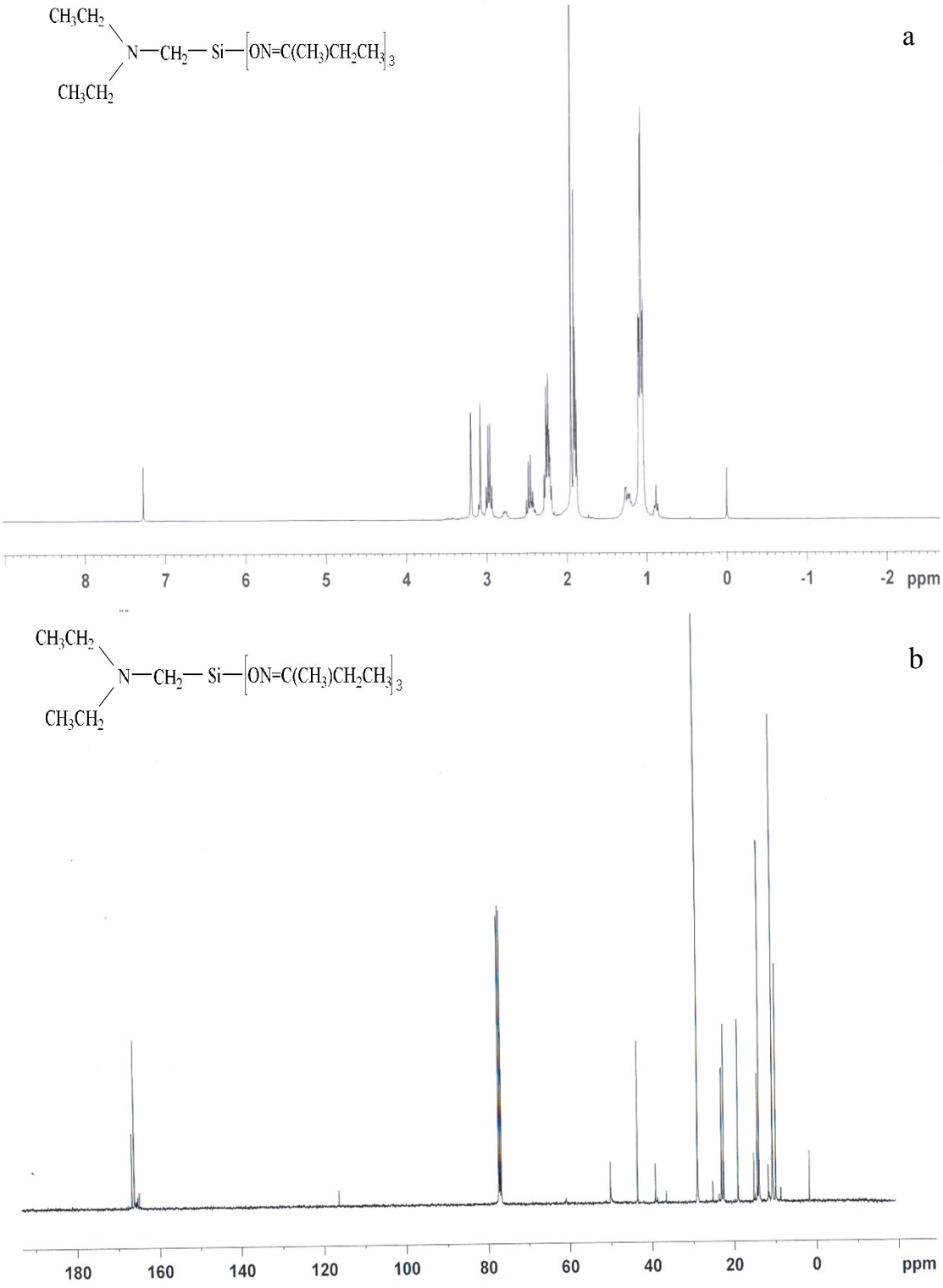


Fig. S1 ^{1}H NMR (a) and $^{13}CNMR$ (b) spectra of α-(N,N-diethyl)aminomethyl tri(methylethylketoxime)silane. Note that δ = 77.00ppm is the solvent peak of $CDCl_3$.

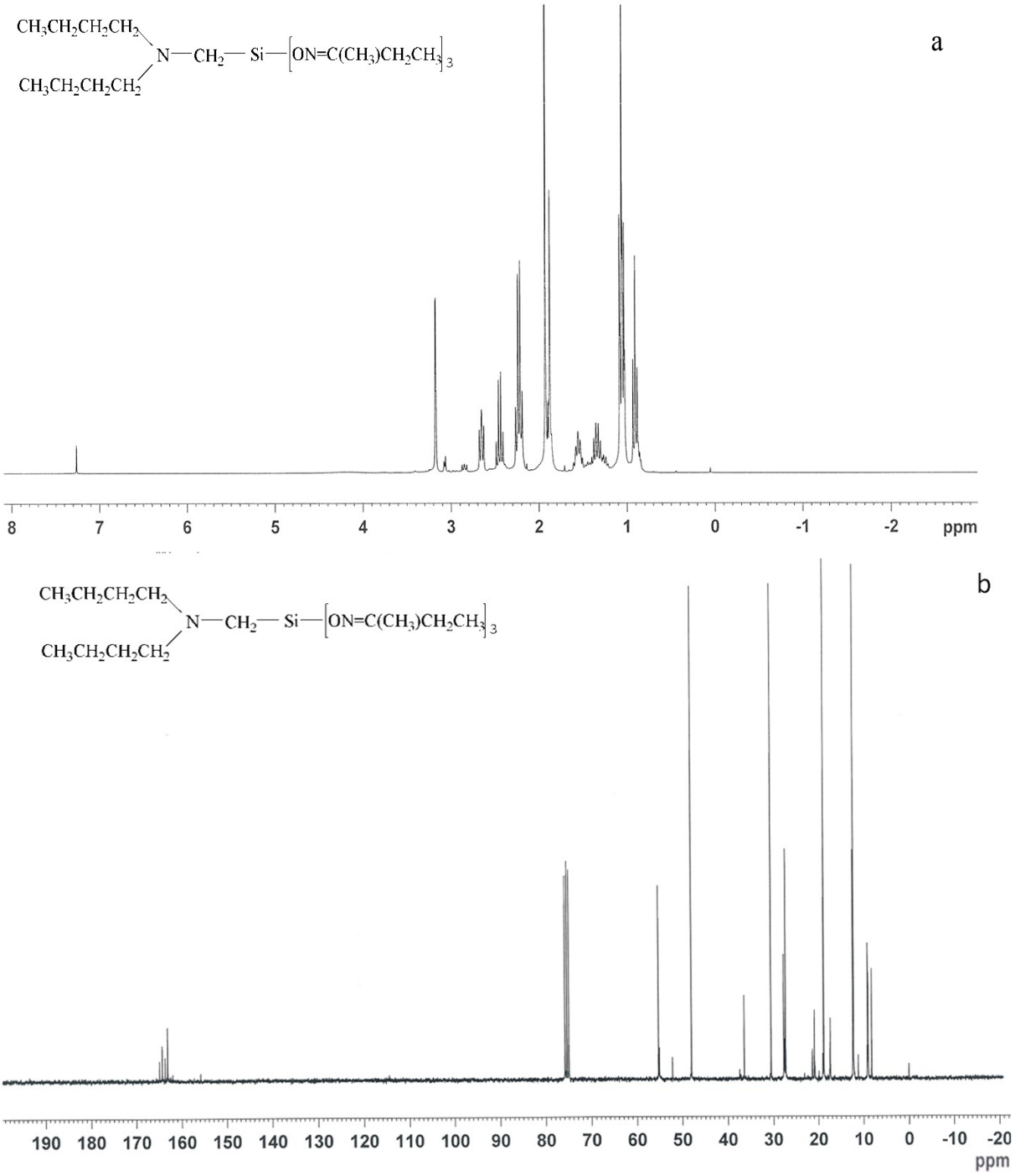


Fig. S2 ^{1}H NMR (a) and $^{13}CNMR$ (b) spectra of α-(N,N-di-n-butyl)aminomethyl tri(methylethylketoxime)silane. Note that δ = 77.00ppm is the solvent peak of $CDCl_3$.

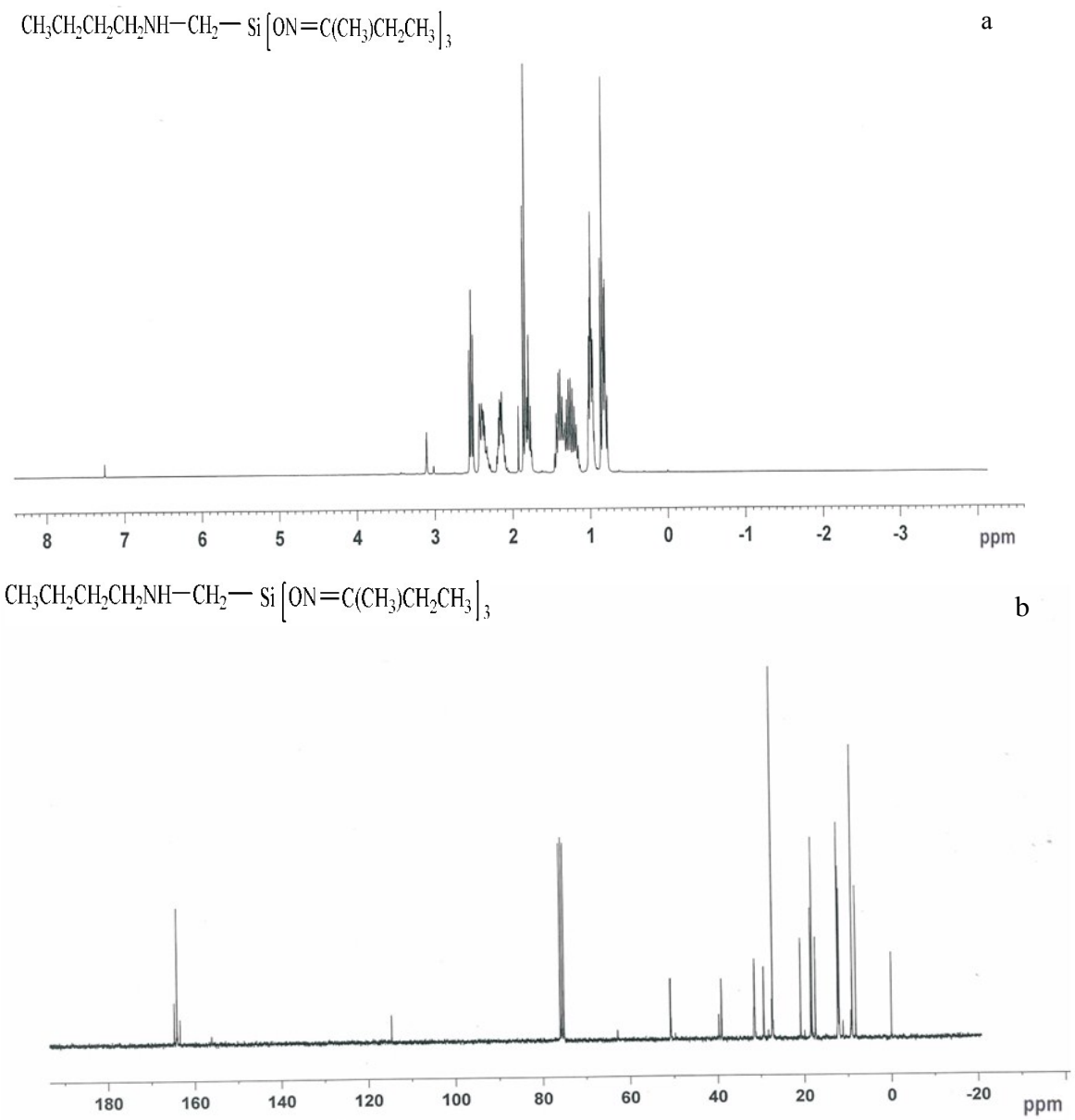


Fig. S3 ^{1}H NMR (a) and $^{13}CNMR$ (b) spectra of α-(N-n-butyl)aminomethyl tri(methylethylketoxime)silane. Note that δ = 77.00ppm is the solvent peak of $CDCl_3$.

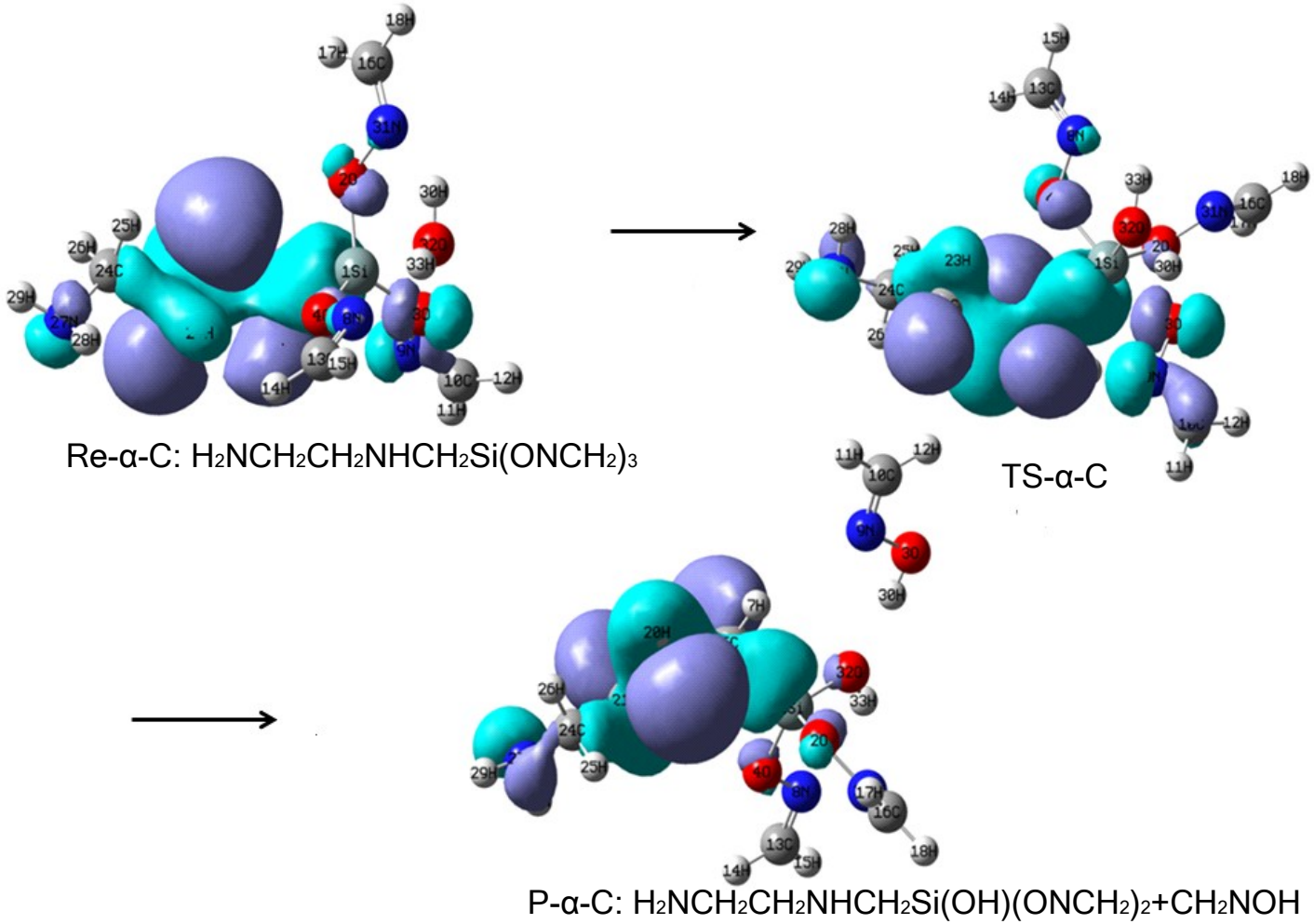


Fig. S4 The HOMO of stationary points for the reaction of α-ethylenediaminetriketoximesilane and H_2O calculated at B3LYP/6-311G**.

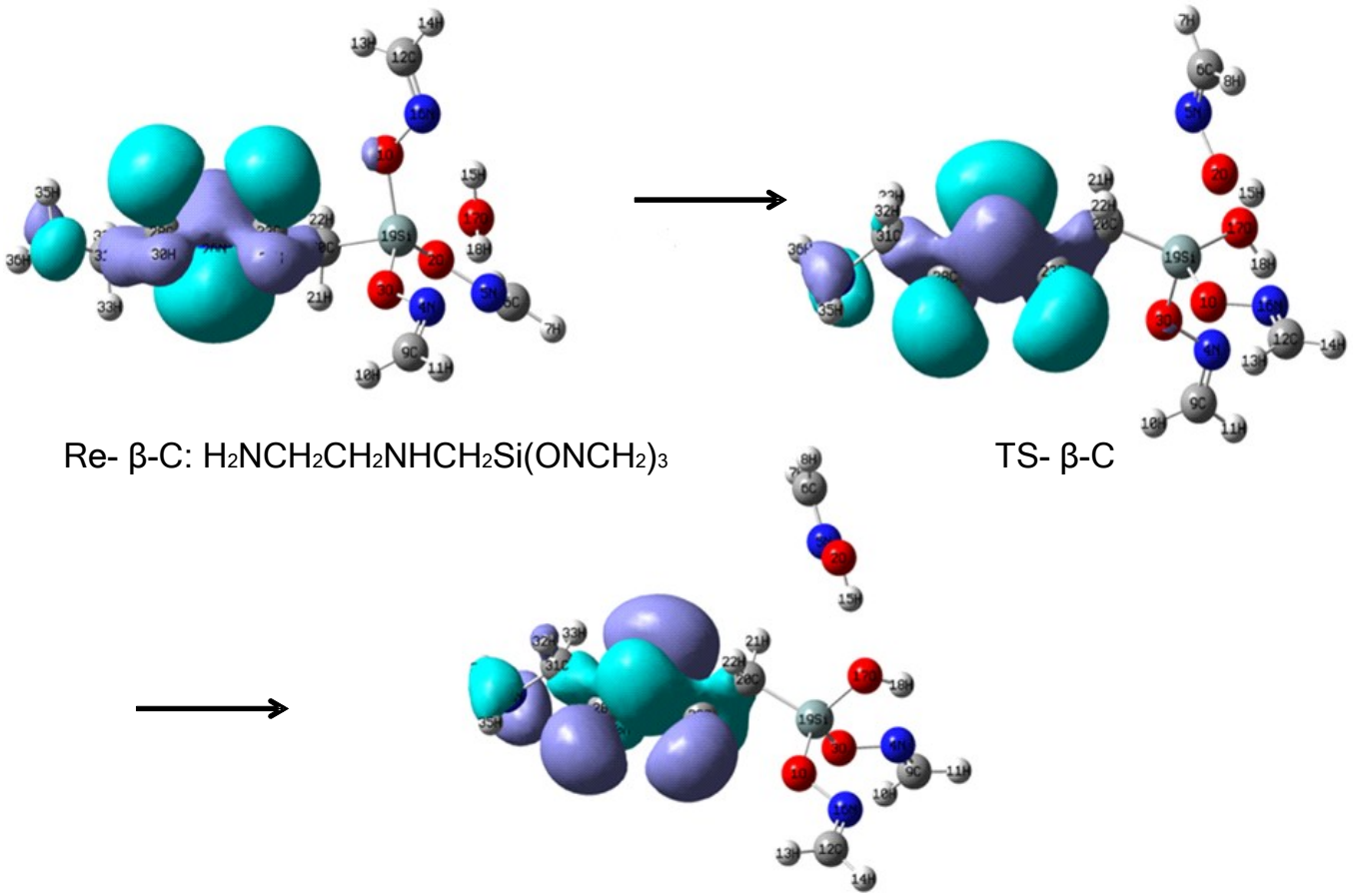
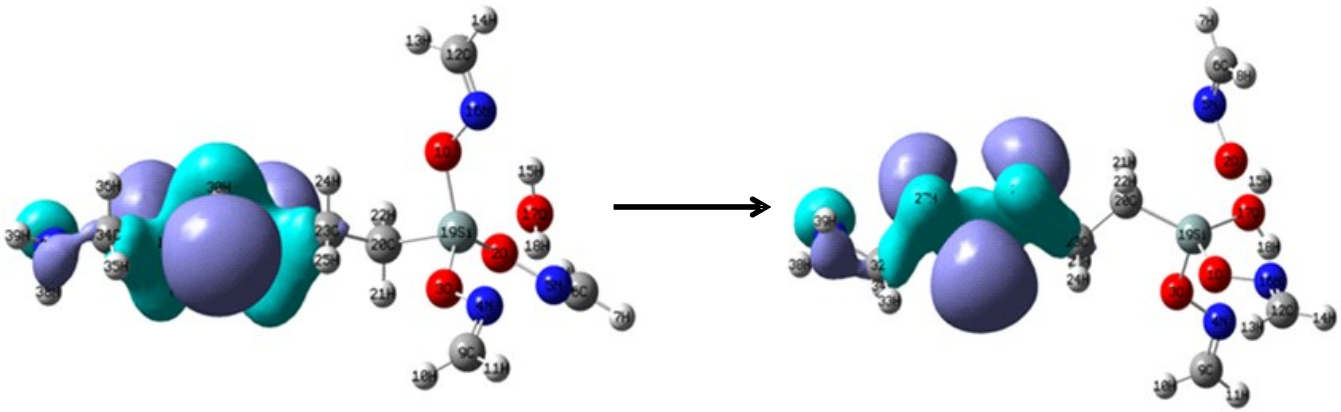
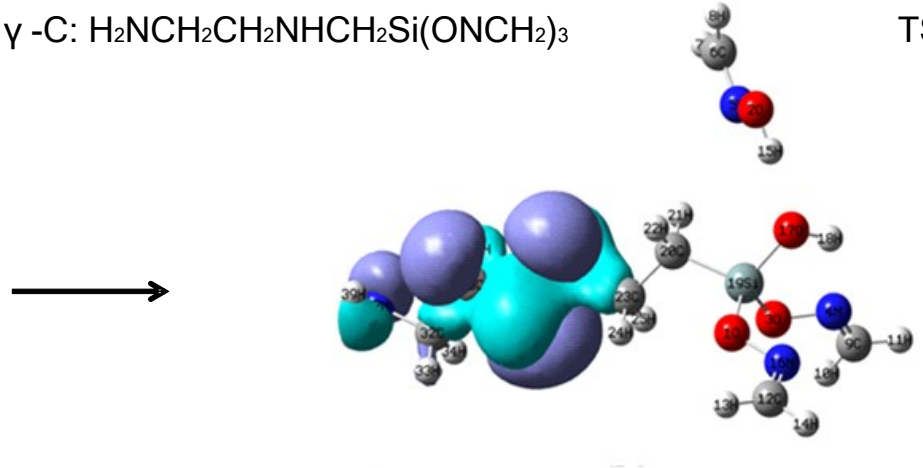


Fig. S5 The HOMO of stationary points for the reaction of β-ethylenediaminetriketoximesilane and H_2O calculated at B3LYP/6-311G**.



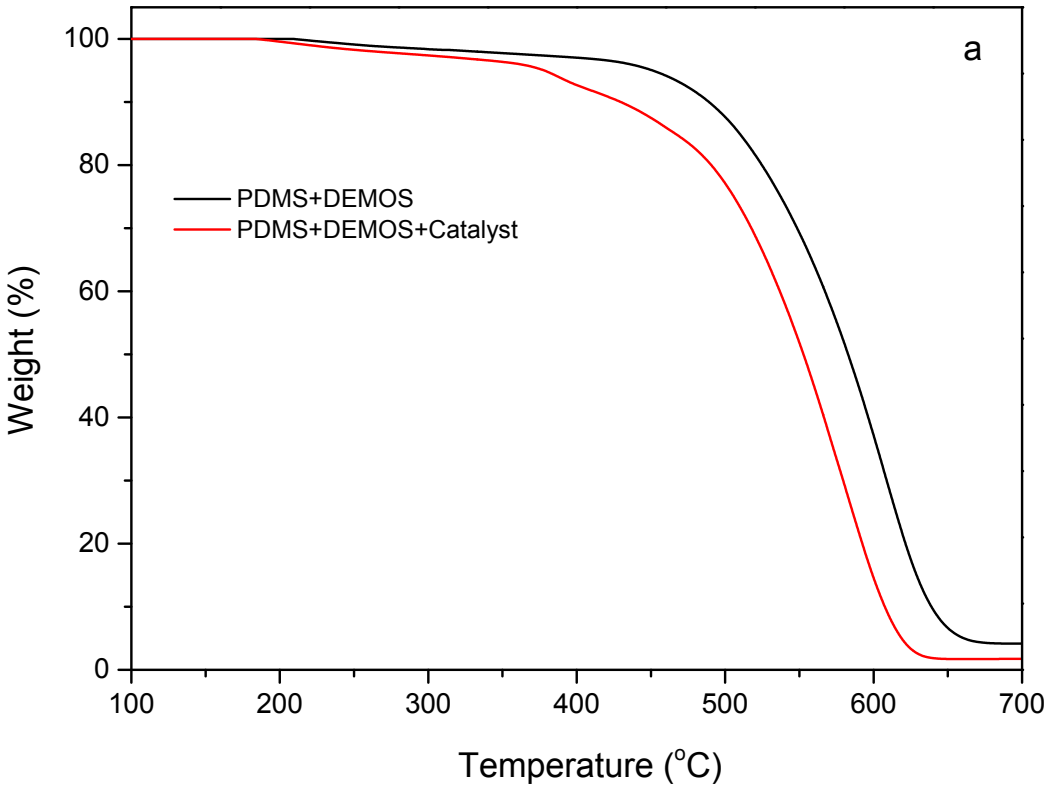
Re- γ -C: $H_2NCH_2CH_2NHCH_2Si(ONCH_2)_3$

TS- γ -C



P- γ -C: $H_2NCH_2CH_2NHCH_2Si(OH)(ONCH_2)_2+CH_2NOH$

Fig. S6 The HOMO of stationary points for the reaction of γ-ethylenediaminetriketoximesilane and H_2O calculated at B3LYP/6-311G**.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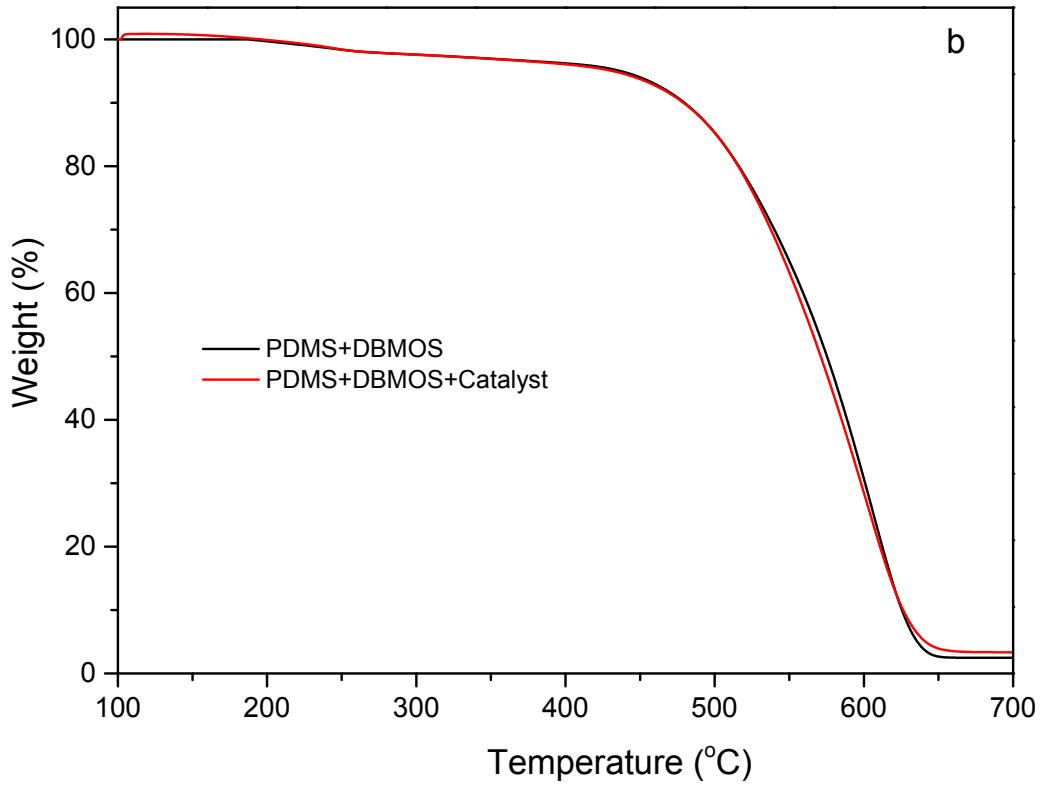
PDMS+DEMOS
PDMS+DEMOS+Catalyst
Weight (%)
Temperature (°C)
100
80
60
40
20
0
100
200
300
400
500
600
700


b
PDMS+DBMOS
PDMS+DBMOS+Catalyst
Weight (%)
Temperature (°C)
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80
60
40
20
0
100
200
300
400
500
600
700

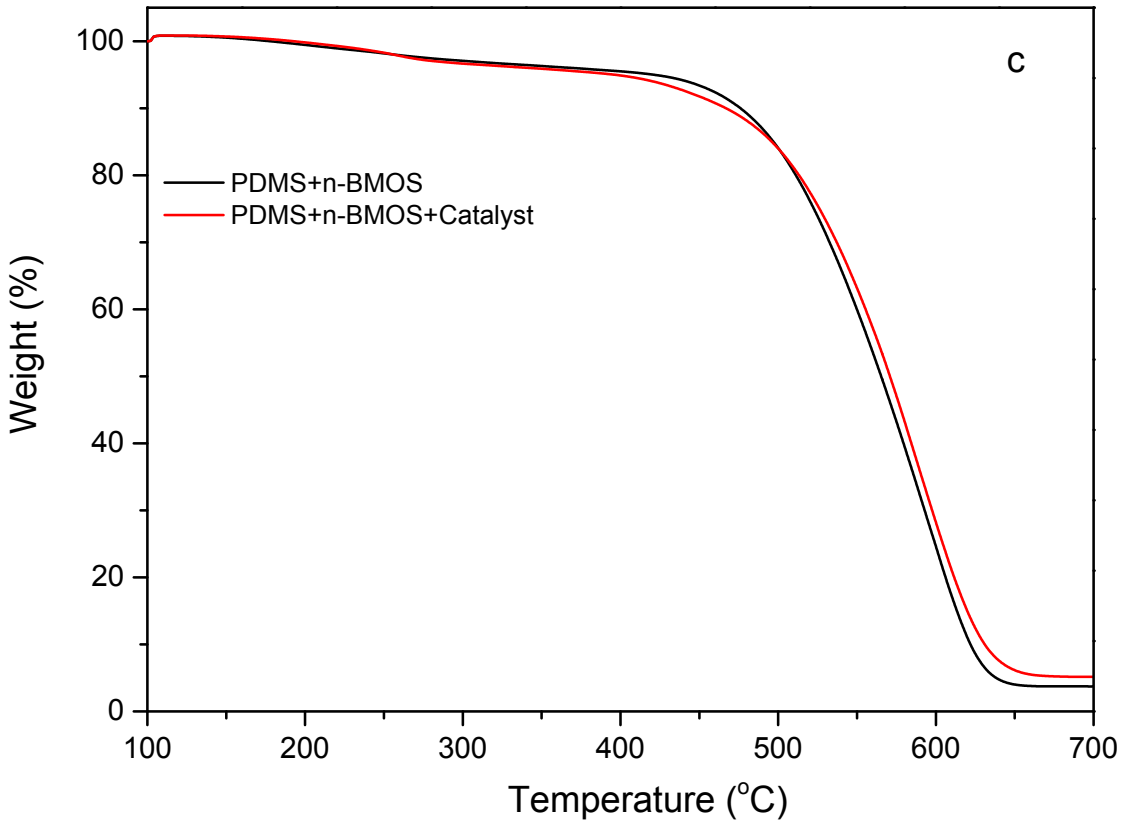

Fig. S7 Effects of catalyst on thermal stability of cross-linked PDMS with (a) DEMOS, (b) DBMOS and (c) n-BMOS.

Table S1. Mechanical properties of examined cross-linked PDMS with different α-amine ketoximesilanes.

Products	Tensile strength (Mpa)	Elongation at break (%)
PDMS+MOS+Catalyst	1.28	0.76
PDMS+DEMOS	1.26	3.50
PDMS+DBMOS	0.56	3.87
PDMS+n-BMOS	0.85	3.73

The mass ratios of PDMS : cross-linker : catalyst = 100 : 5 : 0.2.