H NMR data

**isobutyl POSS chloride [$(C_4H_9)_7Si_8O_{12}$]–Cl**
$_1$H NMR: 1.87 (m, 7H), 0.95 (m, 42H), 0.62 (m, 14H).
Analysis Calculated for $C_{28}H_{63}ClO_{12}Si_8$: C 39.47, H 7.45.
Found: C 39.02, H 7.58.

**cyclopentyl POSS chloride [$(c–C_5H_9)_7Si_8O_{12}$]–Cl**
$_1$H NMR: 1.77 (m, 14H), 1.54 (m, 42H), 1.04 (m, 7H).
Analysis Calculated for $C_{35}H_{63}ClO_{12}Si_8$: C 44.91, H 6.79.
Found: C 44.37, H 6.88.

**isobutyl POSS mono-ol [$(C_4H_9)_7Si_8O_{12}$]–OH**
$_1$H NMR: 1.85 (m, 7H), 0.96 (m, 42H), 0.56 (m, 14H).
Analysis Calculated for $C_{28}H_{64}O_{13}Si_8$: C 40.35, H 7.74.
Found: C 39.96, H 7.68.

**Cyclopentyl POSS mono-ol [$(c–C_5H_9)_7Si_8O_{12}$]–OH**
$_1$H NMR: 1.74 (m, 14H), 1.56 (m, 42H), 0.98 (m, 7H).
Analysis Calculated for $C_{35}H_{64}O_{13}Si_8$: C 45.84, H 7.03.
Found: C 44.16, H 7.10.

**4-methyl phenyl (trioxyisobutyl POSS) silane [$(C_4H_9)_7Si_8O_{12}–O]_3–Si–ArCH_3$**
$_1$H NMR: 7.60 (dd, 2H), 7.15 (dd, 2H), 2.38 (s, 3H),
1.81 (m, 21H), 0.94 (m, 126H), 0.59 (m, 42H). Analysis
Calculated for $C_{91}H_{196}O_{39}Si_{25}$: C 41.94, H 7.54. Found: C
41.17, H 7.68.

**4-methyl phenyl (trioxycyclopentyl POSS) silane [$(C_5H_9)_7Si_8O_{12}–O]_3–Si–ArCH_3$**
$_1$H NMR: 7.63 (dd, 2H), 7.12 (dd, 2H), 2.35 (s, 3H),
1.73 (m, 42H), 1.54 (m, 126H), 0.99 (m, 21H). Analysis
Calculated for $C_{112}H_{196}O_{39}Si_{25}$: C 47.06, H 7.54. Found: C
41.17, H 6.87.

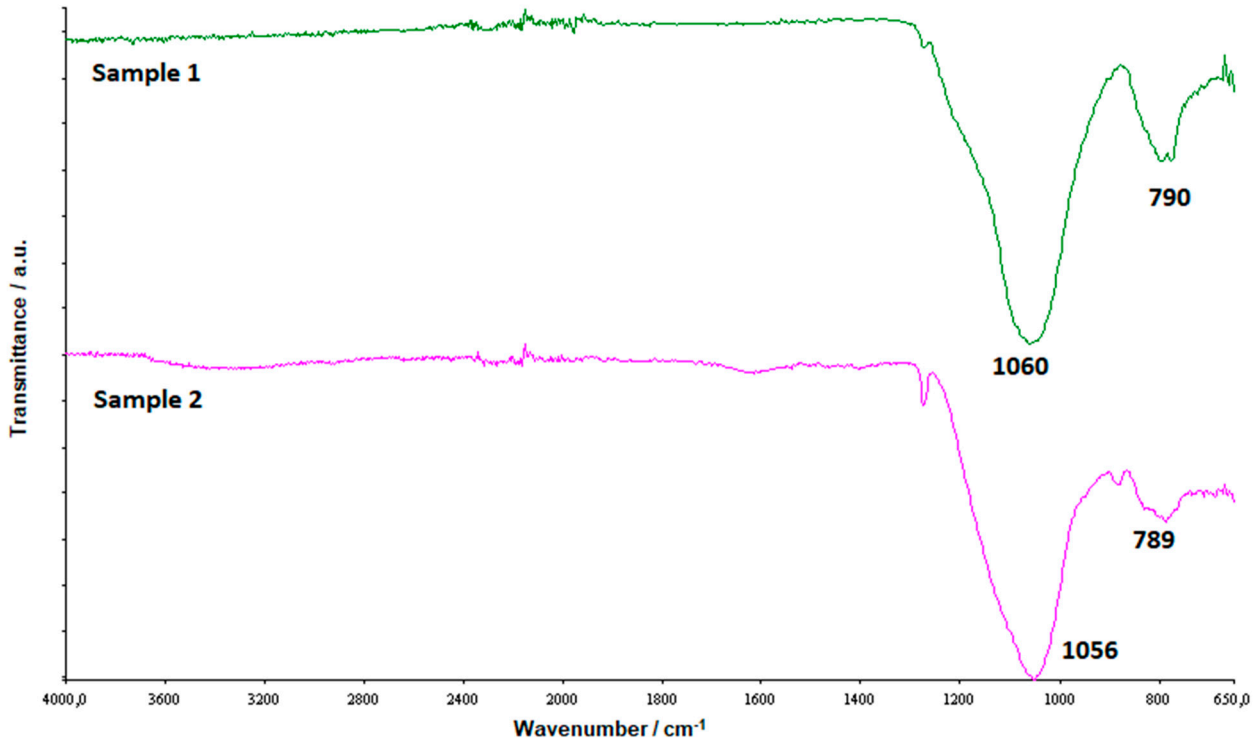


**Figure SM1.** FTIR spectra of the solid residues at 700 °C for the samples **1** and **2**.

**Table SM1.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for **PS** in static air.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|
| 0.1 | 24.8 (± 0.7) | 13.9 (± 0.4) | 0.9968 | 116 (± 3) |
| 0.2 | 25.5 (± 0.6) | 14.8 (± 0.4) | 0.9979 | 123 (± 3) |
| 0.3 | 25.4 (± 0.6) | 15.1 (± 0.4) | 0.9977 | 125 (± 3) |
| 0.4 | 25.1 (± 0.6) | 15.1 (± 0.7) | 0.9931 | 125 (± 6) |
| 0.5 | 24.5 (± 0.8) | 14.8 (± 0.6) | 0.9956 | 123 (± 5) |
| 0.6 | 24.4 (± 0.8) | 15.0 (± 0.5) | 0.9964 | 125 (± 4) |
| 0.7 | 24.2 (± 0.8) | 14.9 (± 0.6) | 0.9957 | 124 (± 5) |
| 0.8 | 23.9 (± 0.7) | 14.9 (± 0.5) | 0.9967 | 124 (± 4) |
| 0.9 | 22.8 (± 0.7) | 14.4 (± 0.5) | 0.9960 | 120 (± 4) |

**Table SM2.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for **PS** in flowing nitrogen.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|
| 0.1 | 33.4 (± 0.7) | 20.4 (± 0.4) | 0.9986 | 170 (± 3) |
| 0.2 | 33.3 (± 0.6) | 20.8 (± 0.4) | 0.9989 | 173 (± 3) |
| 0.3 | 35.1 (± 0.6) | 22.2 (± 0.4) | 0.9990 | 185 (± 3) |
| 0.4 | 34.8 (± 0.8) | 22.3 (± 0.5) | 0.9982 | 185 (± 4) |
| 0.5 | 34.8 (± 0.7) | 22.5 (± 0.5) | 0.9986 | 187 (± 4) |
| 0.6 | 34.6 (± 1.1) | 22.5 (± 0.8) | 0.9966 | 187 (± 7) |
| 0.7 | 34.7 (± 0.8) | 22.7 (± 0.6) | 0.9981 | 189 (± 5) |
| 0.8 | 34.2 (± 0.8) | 22.6 (± 0.6) | 0.9979 | 188 (± 5) |
| 0.9 | 33.7 (± 0.7) | 22.6 (± 0.5) | 0.9986 | 188 (± 4) |

**Table SM3.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for sample **1** in static air.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|
| 0.1 | 30.1 (± 1.4) | 17.2 (± 0.9) | 0.9923 | 143 (± 7) |
| 0.2 | 29.9 (± 0.8) | 17.5 (± 0.5) | 0.9977 | 145 (± 4) |
| 0.3 | 29.3 (± 1.1) | 17.6 (± 0.7) | 0.9950 | 146 (± 6) |
| 0.4 | 29.1 (± 1.6) | 17.7 (± 1.0) | 0.9898 | 147 (± 8) |
| 0.5 | 28.4 (± 1.4) | 17.4 (± 0.9) | 0.9915 | 145 (± 7) |
| 0.6 | 28.4 (± 1.2) | 17.5 (± 0.8) | 0.9939 | 145 (± 7) |
| 0.7 | 28.6 (± 1.5) | 17.8 (± 1.0) | 0.9907 | 148 (± 8) |
| 0.8 | 28.3 (± 1.2) | 17.7 (± 0.8) | 0.9932 | 147 (± 7) |
| 0.9 | 27.9 (± 1.4) | 17.6 (± 1.0) | 0.9911 | 146 (± 8) |

**Table SM4.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for sample **1** in flowing nitrogen.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|
| 0.1 | 37.2 (± 1.3) | 23.0 (± 0.9) | 0.9958 | 191 (± 7) |
| 0.2 | 36.8 (± 0.5) | 23.2 (± 0.3) | 0.9994 | 193 (± 2) |
| 0.3 | 37.1 (± 0.5) | 23.6 (± 0.4) | 0.9993 | 196 (± 3) |
| 0.4 | 37.1 (± 0.5) | 23.8 (± 0.4) | 0.9993 | 198 (± 3) |
| 0.5 | 37.1 (± 0.6) | 24.0 (± 0.4) | 0.9990 | 199 (± 3) |
| 0.6 | 37.1 (± 0.5) | 24.2 (± 0.3) | 0.9994 | 201 (± 2) |
| 0.7 | 36.9 (± 0.7) | 24.2 (± 0.5) | 0.9989 | 201 (± 4) |
| 0.8 | 36.1 (± 0.9) | 24.0 (± 0.6) | 0.9980 | 199 (± 5) |
| 0.9 | 35.5 (± 1.6) | 23.9 (± 1.2) | 0.9930 | 199 (± 10) |

**Table SM5.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for sample **2** in static air.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 0.1 | 31.1 (± 0.6) | 18.2 (± 0.3) | 0.9989 | 151 (± 2) |
| 0.2 | 30.7 (± 1.5) | 18.4 (± 0.9) | 0.9918 | 153 (± 7) |
| 0.3 | 30.7 (± 0.6) | 18.4 (± 0.4) | 0.9988 | 153 (± 3) |
| 0.4 | 30.4 (± 1.5) | 18.7 (± 1.0) | 0.9915 | 155 (± 8) |
| 0.5 | 30.1 (± 0.9) | 18.7 (± 0.6) | 0.9970 | 155 (± 5) |
| 0.6 | 30.2 (± 1.2) | 18.9 (± 0.8) | 0.9948 | 157 (± 7) |
| 0.7 | 29.4 (± 0.9) | 18.7 (± 0.6) | 0.9965 | 155 (± 5) |
| 0.8 | 29.2 (± 0.9) | 18.6 (± 0.6) | 0.9965 | 155 (± 5) |
| 0.9 | 28.8 (± 0.7) | 18.5 (± 0.5) | 0.9981 | 154 (± 4) |

**Table SM6.** Regression coefficients and apparent activation energies ($E_a$) of degradation by the FWO integral isoconversional method for sample **2** in flowing nitrogen.

| $\alpha$ | $a$ | $b \cdot 10^{-3}$ /K | r | $E_a$ /(kJ·mol$^{-1}$) |
|---|---|---|---|---|
| 0.1 | 37.5 (± 1.7) | 23.3 (± 1.1) | 0.9932 | 194 (± 9) |
| 0.2 | 37.1 (± 1.1) | 23.4 (± 0.7) | 0.9970 | 194 (± 6) |
| 0.3 | 36.0 (± 1.0) | 23.6 (± 0.7) | 0.9974 | 196 (± 6) |
| 0.4 | 36.2 (± 0.9) | 23.3 (± 0.6) | 0.9977 | 194 (± 5) |
| 0.5 | 36.2 (± 1.6) | 23.5 (± 1.1) | 0.9933 | 195 (± 9) |
| 0.6 | 36.1 (± 1.9) | 23.6 (± 1.3) | 0.9909 | 196 (± 11) |
| 0.7 | 36.2 (± 1.6) | 23.9 (± 1.1) | 0.9937 | 199 (± 9) |
| 0.8 | 35.7 (± 0.9) | 23.8 (± 0.6) | 0.9980 | 198 (± 5) |
| 0.9 | 34.9 (± 0.7) | 23.6 (± 0.5) | 0.9985 | 196 (± 4) |