Electronic Supplementary Material (ESI) for RSC Advances

Low surface free energy cyanate ester - silica hybrid (CE-SiO2) nanomaterials for low k dielectric application

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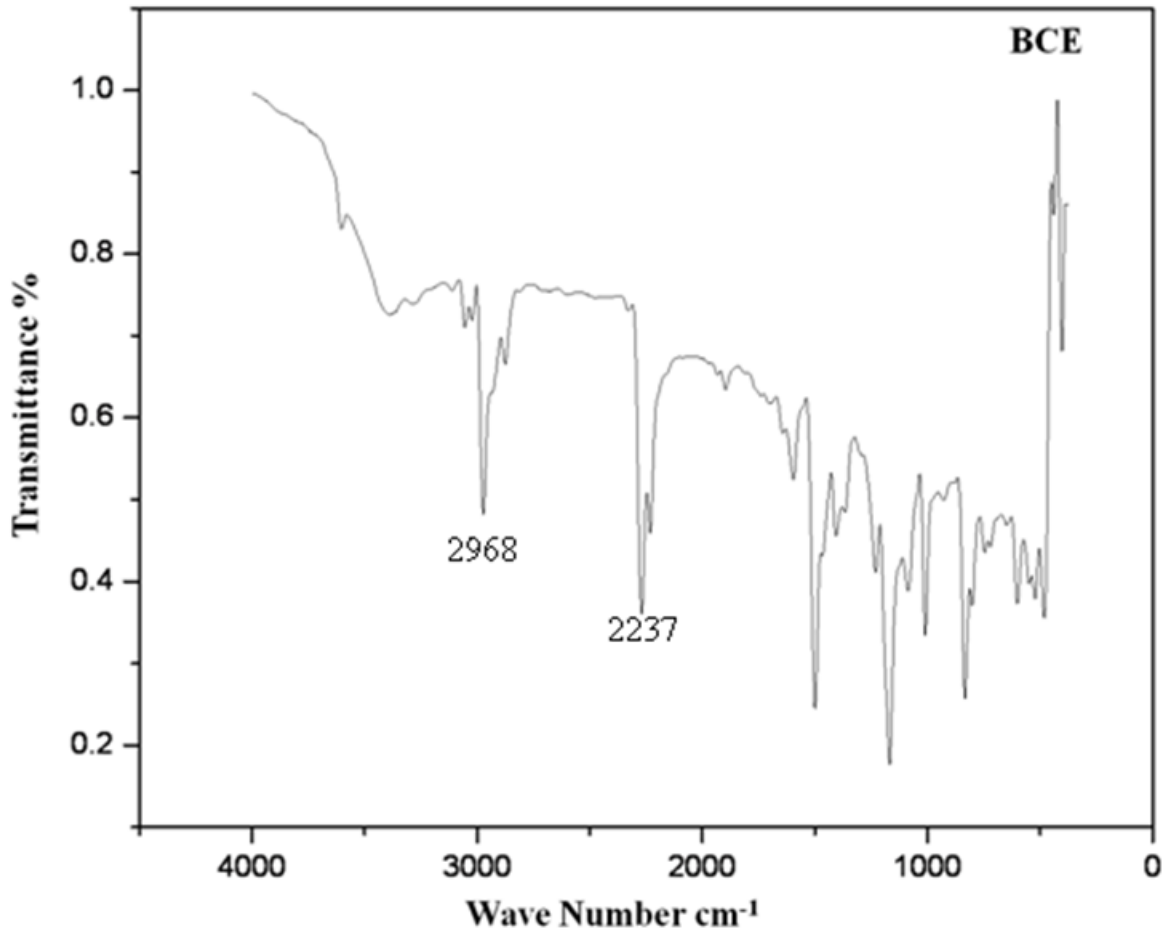

Figure S1: FT-IR Spectrum of 1,4-bis(2-(4-cyanatophenyl)propan-2-yl)benzene

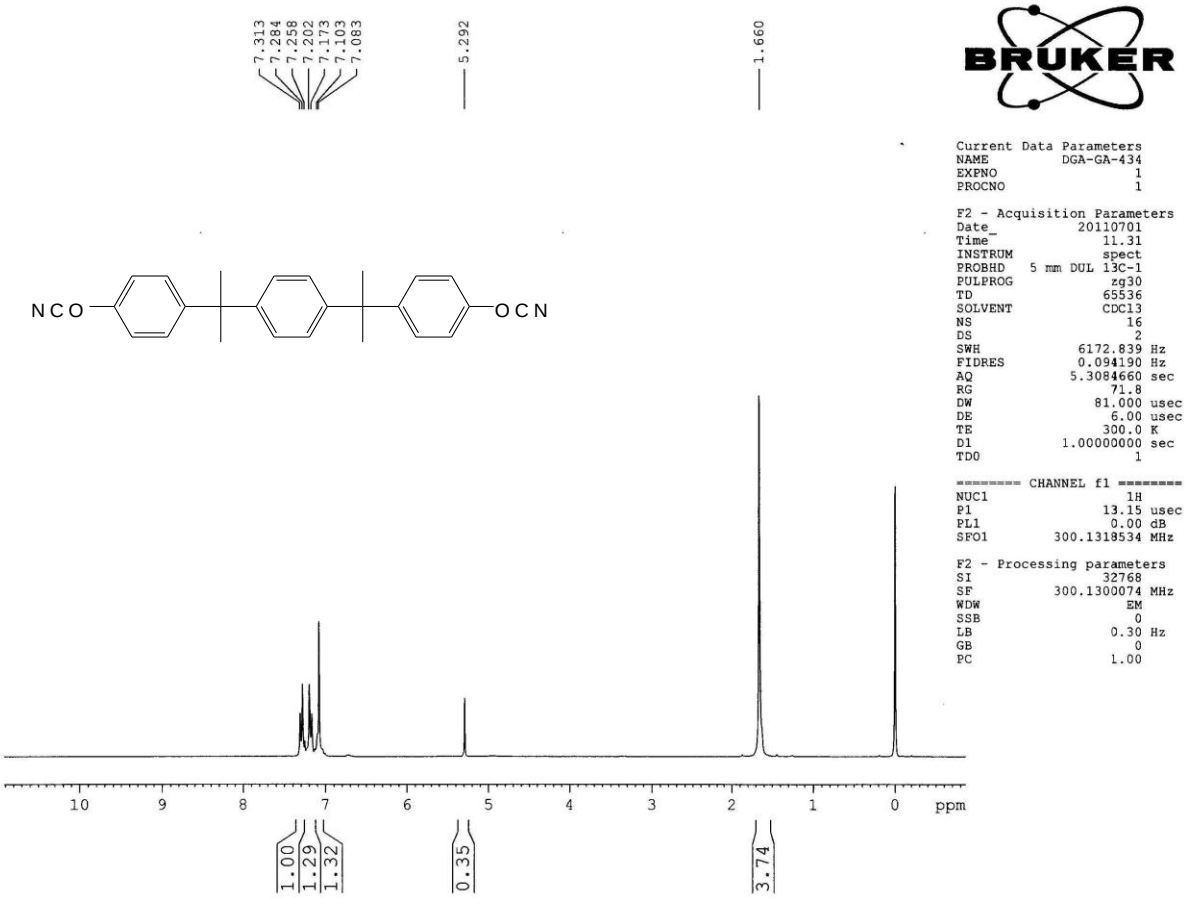

Figure S2: ^{1}HNMR Spectrum of 1,4-bis(2-(4-cyanatophenyl)propan-2-yl)benzene

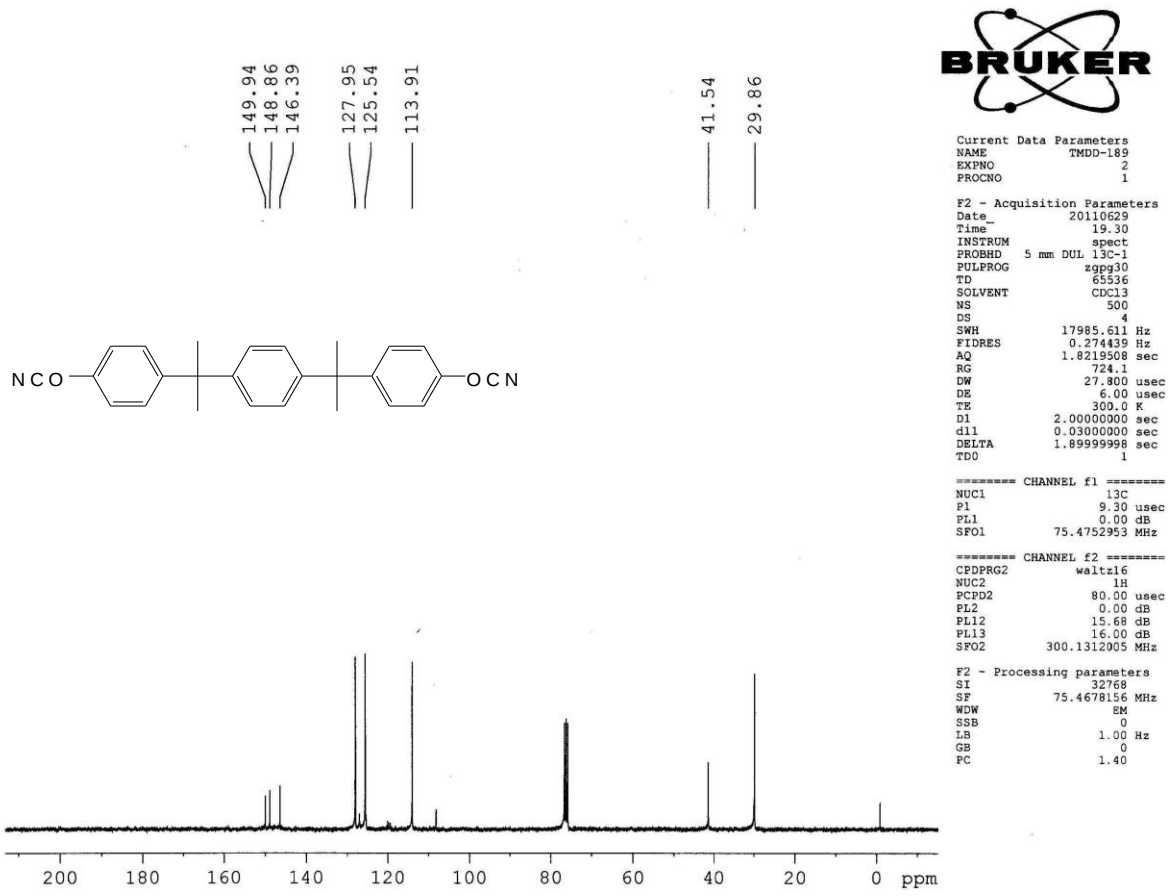

Figure S3: ^{13}CNMR Spectrum of 1,4-bis(2-(4-cyanatophenyl)propan-2-yl)benzene

Table S1: Curing time cycle of Neat CE and CE-SiO_2 hybrid nanocomposites

Description	BCE (mg)	APTES (mg)	GPTMS (mg)	TEOS (mg)	Ratio (BCE:*CA:TEOS)	1,4-Dioxane (ml)	0.1M HCl_{aq} (µl)	Curing cycle Temp (^{0}C) / min	Appearance
Neat CE	200	0	0	0	-	4	0	120+180^{0}C / 120+120 min	Transparent
BACE1	200	45	0	200	1:0.5:1	4	83	120+180^{0}C / 120+120 min	Transparent
BACE2	200	90	0	200	1:1:1	4	96	120+180^{0}C / 120+120 min	Transparent
BACE3	200	135	0	200	1:1.5:1	4	110	120+180^{0}C / 120+120 min	Translucent
BACE4	200	180	0	200	1:2:1	4	123	120+180^{0}C / 120+120 min	Translucent
BGCE1	200	0	60	200	1:0.5:1	4	83	120+180^{0}C / 120+120 min	Transparent
BGCE2	200	0	119	200	1:1:1	4	96	120+180^{0}C / 120+120 min	Transparent
BGCE3	200	0	179	200	1:1.5:1	4	110	120+180^{0}C / 120+120 min	Translucent
BGCE4	200	0	238	200	1:2:1	4	123	120+180^{0}C / 120+120 min	Translucent