

Controlled Formation of Either Macroporous or Hollow Silica Particles in Non-aqueous Silicone Dispersions

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Supporting Information

Table 1S: BA-catalyzed formulations (2.5g) with varying TEOS loadings and their average particle sizes (μm)^a

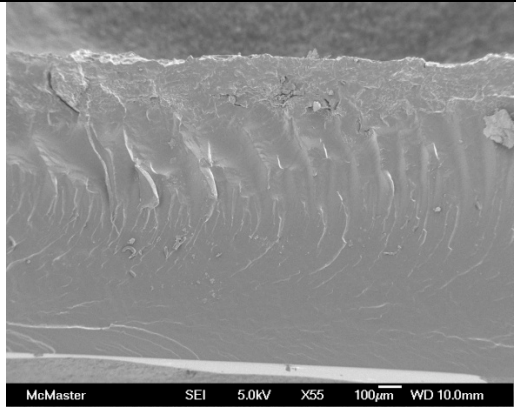
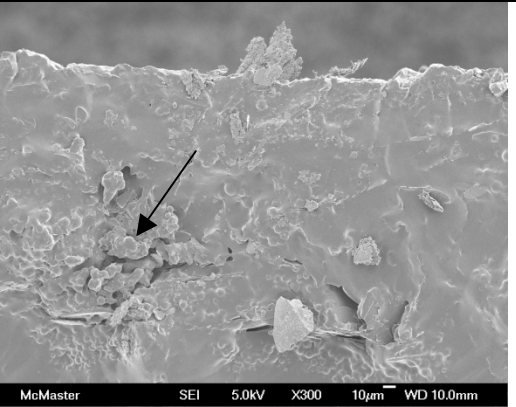
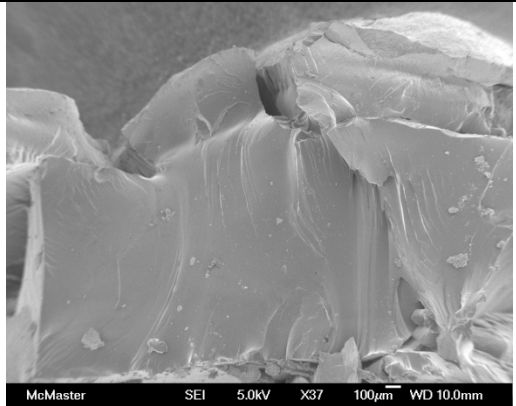
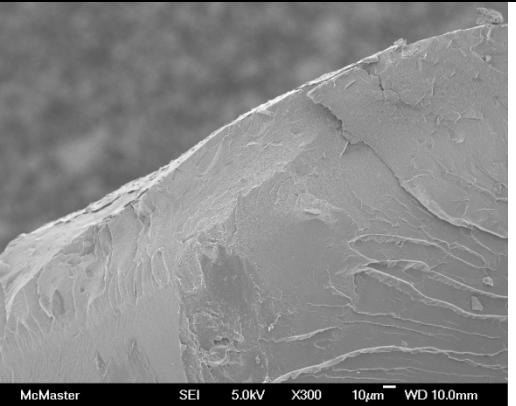
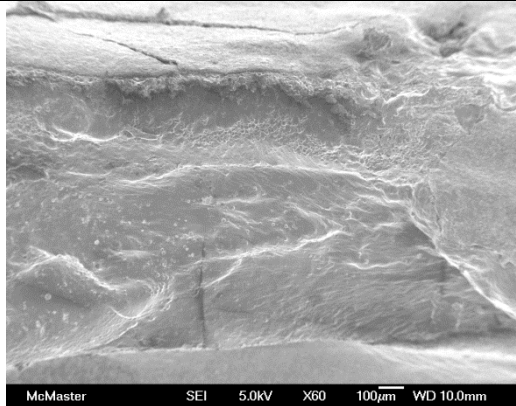
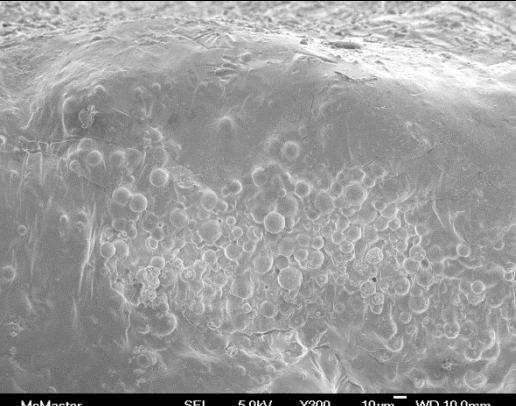
Formulation #	Parameter	Weight (g)	Wt. %	Formulation #	Parameter	Weight (g)	Wt. %
1	HO-PDMS	2.125	85	10	HO-PDMS	1.5	60
	TEOS	0.125	5		TEOS	0.625	25
	BA	0.25	10		BA	0.25	10
	PEG1000	0	0		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	10.6 $\pm$ 4.4	
2	HO-PDMS	2	80	11	VT-PDMS	1.875	75
	TEOS	0.25	10		TEOS	0.375	15
	BA	0.25	10		BA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
3	HO-PDMS	1.875	75	12	VT-PDMS	1.75	70
	TEOS	0.375	15		TEOS	0.5	20
	BA	0.25	10		BA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
4	HO-PDMS	1.75	70	13	VT-PDMS	1.625	65
	TEOS	0.5	20		TEOS	0.625	25
	BA	0.25	10		BA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
5	HO-PDMS	1.625	65	14	VT-PDMS	1.75	70
	TEOS	0.625	25		TEOS	0.375	15
	BA	0.25	10		BA	0.25	10
	PEG1000	0	0		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	10.2 $\pm$ 4.7	
6	HO-PDMS	2	80	15	VT-PDMS	1.625	65
	TEOS	0.125	5		TEOS	0.5	20
	BA	0.25	10		BA	0.25	10
	PEG1000	0.125	5		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	9.4 $\pm$ 4.0	
7	HO-PDMS	1.875	75	16	VT-PDMS	1.5	60
	TEOS	0.25	10		TEOS	0.625	25
	BA	0.25	10		BA	0.25	10
	PEG1000	0.125	5		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	9.6 $\pm$ 3.6	
8	HO-PDMS	1.75	70	17	VT-PDMS	1.5	60
	TEOS	0.375	15		TEOS	0.625	25
	BA	0.25	10		BA	0.25	10
	PEG1000	0.125	5		0.6 mM PEG600 w/ Fluorescein	0.125	5
	Avg. Particle Size	11.6 $\pm$ 3.6					
9	HO-PDMS	1.625	65	18	VT-PDMS	1.5	60
	TEOS	0.5	20		TEOS	0.625	25
	BA	0.25	10		BA	0.25	10
	PEG1000	0.125	5		HSA-PEG600	0.125	5
	Avg. Particle Size	11.1 $\pm$ 3.4					

^a At 5% and 10%T loadings, cohesive elastomers couldn't be obtained with or without PEG

Table 2S: DDA-catalyzed formulations (2.5g) with varying TEOS loadings and their average particle sizes (μm)^a

Formulation #	Parameter	Weight (g)	Wt. %	Formulation #	Parameter	Weight (g)	Wt. %
19	HO-PDMS	2.125	85	28	HO-PDMS	1.5	60
	TEOS	0.125	5		TEOS	0.625	25
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0	0		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	4.5 ± 1.4	
20	HO-PDMS	2	80	29	VT-PDMS	1.875	75
	TEOS	0.25	10		TEOS	0.375	15
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
21	HO-PDMS	1.875	75	30	VT-PDMS	1.75	70
	TEOS	0.375	15		TEOS	0.5	20
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
22	HO-PDMS	1.75	70	31	VT-PDMS	1.625	65
	TEOS	0.5	20		TEOS	0.625	25
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0	0		PEG600	0	0
	Avg. Particle Size	-			Avg. Particle Size	-	
23	HO-PDMS	1.625	65	32	VT-PDMS	1.75	70
	TEOS	0.625	25		TEOS	0.375	15
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0	0		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	3.3 ± 1.5	
24	HO-PDMS	2	80	33	VT-PDMS	1.625	65
	TEOS	0.125	5		TEOS	0.5	20
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0.125	5		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	3.0 ± 1.1	
25	HO-PDMS	1.875	75	34	VT-PDMS	1.5	60
	TEOS	0.25	10		TEOS	0.625	25
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0.125	5		PEG600	0.125	5
	Avg. Particle Size	-			Avg. Particle Size	3.5 ± 2.0	
26	HO-PDMS	1.75	70	35	VT-PDMS	1.75	70
	TEOS	0.375	15		TEOS	0.375	15
	DDA	0.25	10		DDA	0.25	10
	PEG1000	0.125	5		0.6 mM PEG600 w/ Fluorescein	0.125	5
	Avg. Particle Size	3.8 ± 0.9					
27	HO-PDMS	1.625	65				
	TEOS	0.5	20				
	DDA	0.25	10				
	PEG1000	0.125	5				
	Avg. Particle Size	4.9 ± 1.8					

^a At 5% and 10%T loadings, cohesive elastomers couldn't be obtained with or without PEG

A (BA , 25%T, no PEG)	B (BA , 25%T, no PEG)
	
C (DDA , 20%T, no PEG)	D (DDA , 20%T, no PEG)
	
E (BA , 15%T)	F (BA , 15%T)
	
G (BA , 20%T)	H (BA , 20%T)

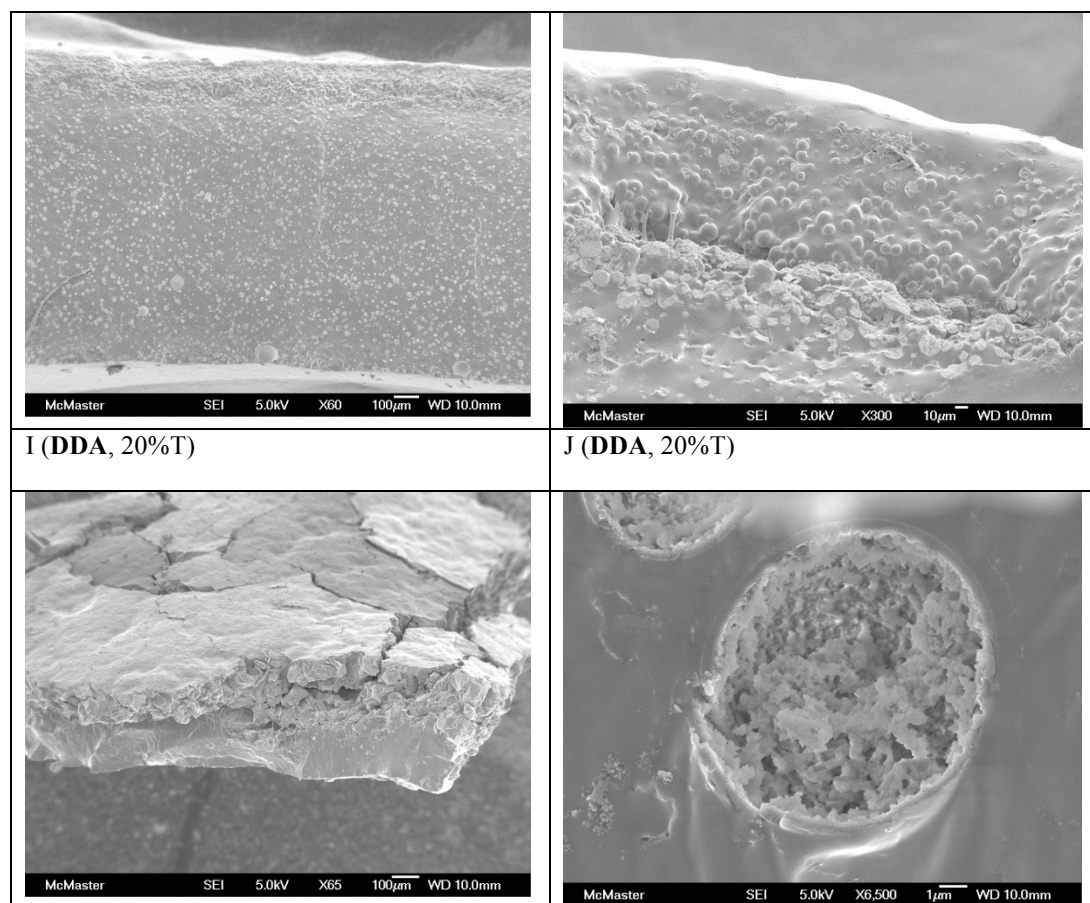


Figure 1S: SEM images of various **BA** and **DDA** catalyzed elastomers at different magnifications. Arrow in B points out few solid particles that appear non-reproducibly in **BA** catalyzed systems without PEG.

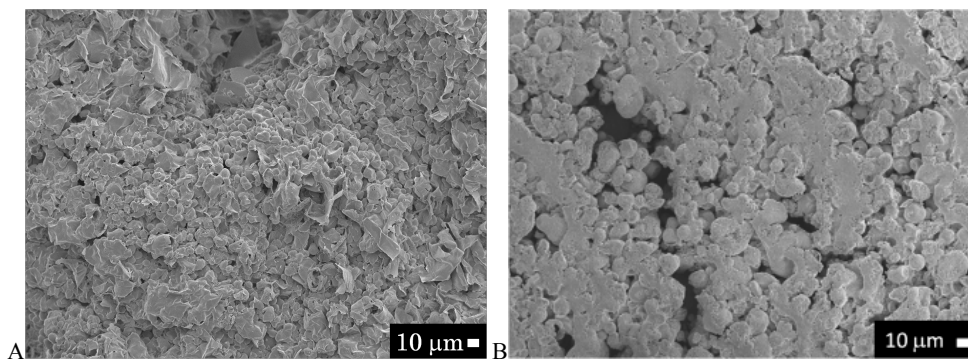
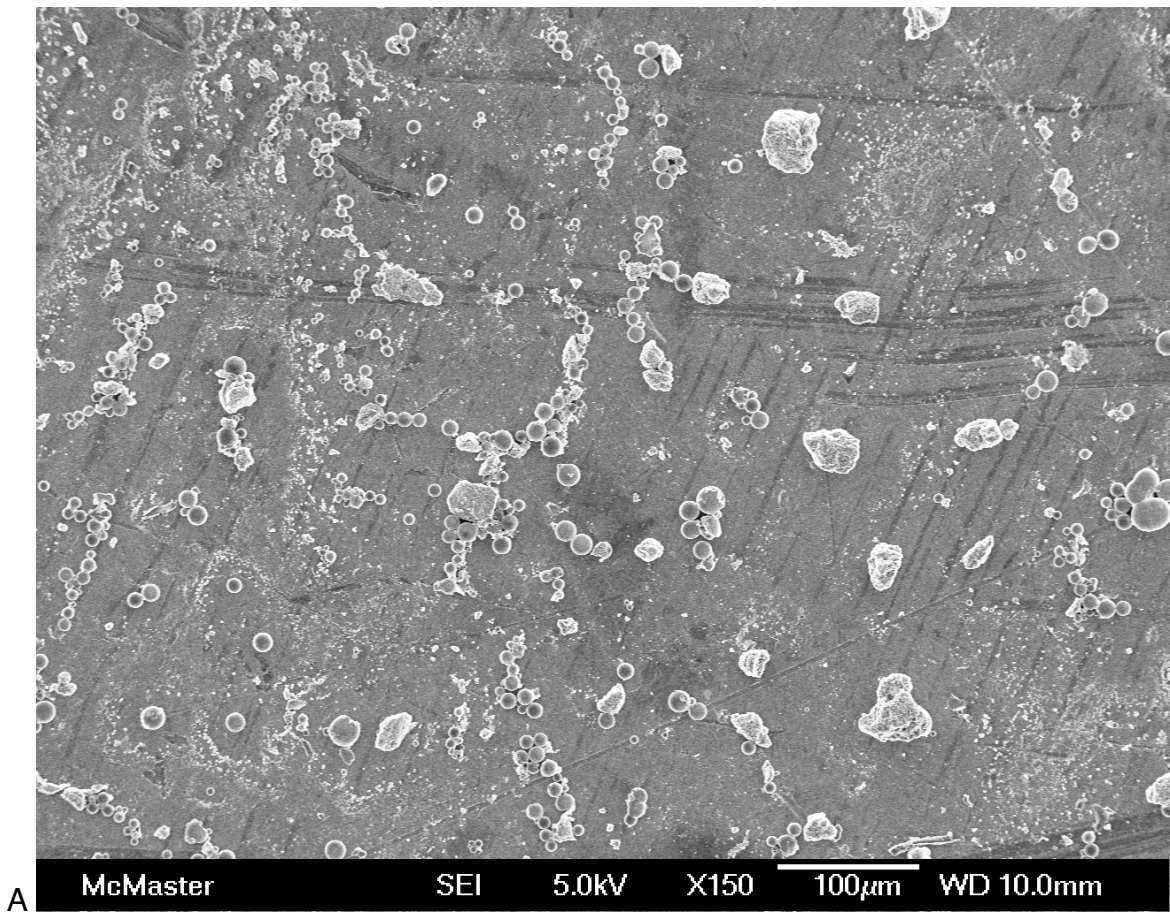


Figure 2S: SEM images of cured elastomers containing 25%T, TEG and catalyzed with **BA** (A) or **DDA** (B). With low molecular weight PEG, it was not possible to prepare silica particles of precise morphology.



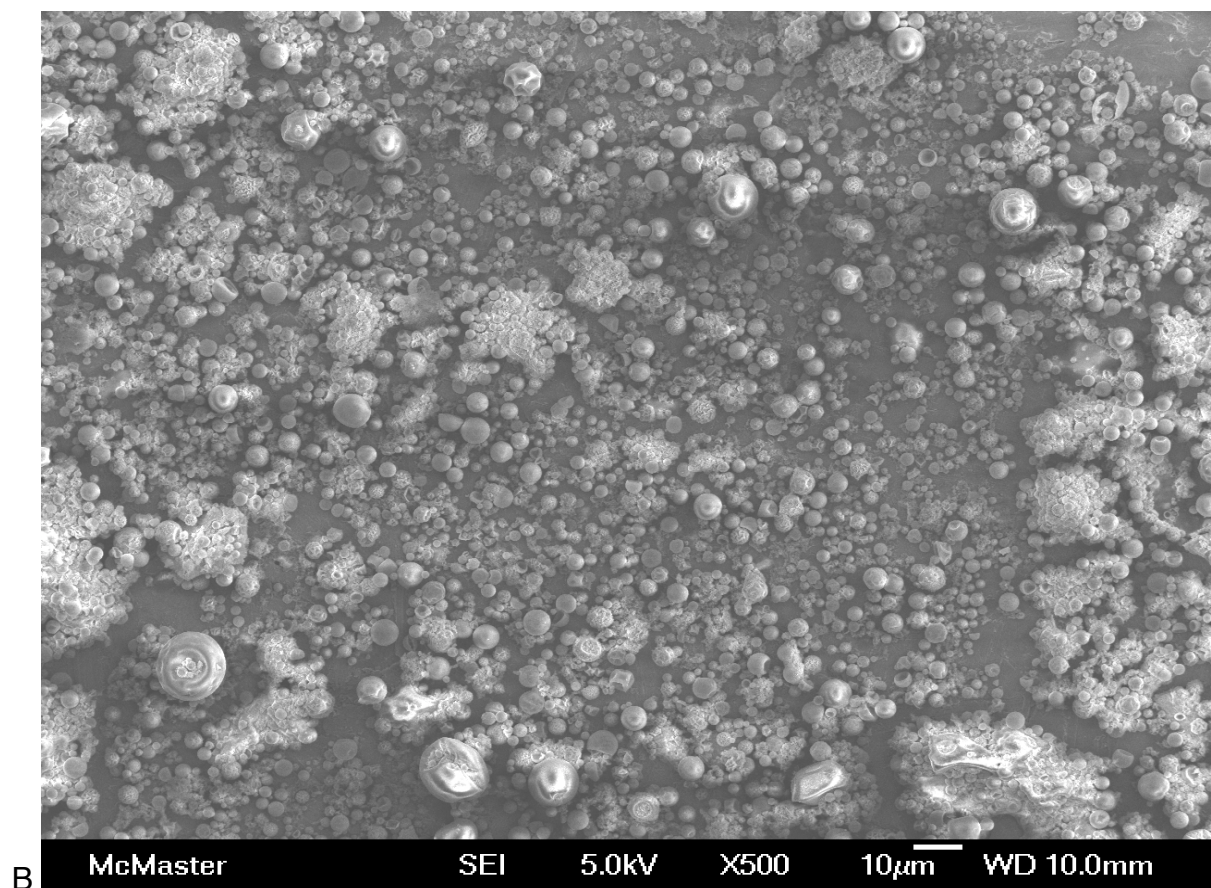


Figure 3S: Low resolution SEM images of crushed particles isolated from silicone oil VT-PDMS. A: BA-containing 25%T. B: DDA-catalyzed particles with 15%T (for high resolution images, see Figure 5 in the text).