

Supporting Information for

**Calcium stearate as acid scavenger for  
synthesizing bromobutyl rubber at high  
concentration in a Microreactor system**

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## 1. Repeatability of $^1\text{H}$ -NMR spectra

In this work, most of the quantitative analysis is based on the  $^1\text{H}$ -NMR spectra. To ensure the accuracy of this measurement, each sample has been detected five times. Here, we randomly select five samples as evidence to evaluate the repeatability of  $^1\text{H}$ -NMR spectra. The measurement error could be shown in the following Table S1. Three parameters of the sample,  $X_{trans}$ ,  $Y_{BIIR-1}$  and  $w$ , are used for the evaluation. The results can be seen in Table S1. Obviously, this method has a good repeatability and the standard difference of these three parameters are all less than 1.5%. Then the results we get from this method is relatively accurate.

**Table S1. The measurement error of  $^1\text{H}$ -NMR spectra\***

No.	Repetition	$X_{trans}$ (%)	$\mu_{trans}$ (%)	$SD_{trans}$ (%)	$Y_{BIIR-1}$ (%)	$\mu_{BIIR-1}$ (%)	$SD_{BIIR-1}$ (%)	$w$ (%)	$\mu_w$ (%)	$SD_w$ (%)
1	1	76.89			38.05			68.32		
	2	76.29			36.65			66.46		
	3	75.30	76.26	0.78	37.99	36.98	1.01	68.98	67.86	1.36
	4	75.67			36.50			69.17		
	5	77.15			35.71			66.37		
2	1	30.96			24.35			87.16		
	2	32.06			25.03			85.98		
	3	32.08	31.78	0.47	24.10	24.65	0.47	87.63	86.57	0.79
	4	31.87			24.56			86.28		
	5	31.92			25.23			85.81		
3	1	42.45			29.80			78.30		
	2	42.48			31.73			79.93		
	3	42.98	42.94	0.48	33.43	31.65	1.32	76.24	78.01	1.36
	4	43.56			32.05			78.22		



$x_{IIR}$ (wt%)	4.88	6.75	9.45	14.77	15.25	18.46	21.51	24.31
$\mu$ (mPa·s)	4.59	9.68	35.1	181	297	711	1690	4340

\* $v_s$  is the shear rate of coaxial cylinder rheometer;  $x_{IIR}$  stands for the mass concentration of IIR;  $\mu$  represents the detected viscosity of IIR solution.

Table S2 declares that  $\mu$  varies with concentration of IIR. Especially, when  $x_{IIR}$  is less than 9.45 wt%, growth of  $\mu$  is relatively slow and  $\mu$  is always less 50 mPa·s. However, if  $x_{IIR}$  is larger than 9.45 wt%,  $\mu$  increases rapidly, even larger than 200 mPa·s at 15.25 wt%. Thus, compared with our previous 10 wt% IIR solution, 15 wt% IIR solution used in this work has a rather high viscosity.

### 3. Selectivity of BIIR-1 ( $w$ ) from different companies

Detailed data of different BIIR from different companies, for instance, ExxonMobil, Lanxess and Cenway New Materials Co. Ltd. are provided in the following Table S3.

**Table S3.** Selectivity of BIIR-1 ( $w$ ) from different companies

Type	Exxon 2222	Exxon 2223	Lanxess 2030	Lanxess 2031	Cenway 2302	Cenway 2303	Cenway 2309	Cenway 2310
$w$ (%)	92.07	92.61	95.15	91.30	93.94	94.21	89.94	93.72