

## Supporting Information

### Research on Mechanical Properties and Sensitivity of a Novel Modified Double-Base Rocket Propellant Plasticized by Bu-NENA

**The Authors:**

Shixiong Sun <sup>1,2</sup>, Benbo Zhao <sup>1,2</sup>, Yuan Cheng <sup>1,\*</sup> and Yujun Luo <sup>3,\*</sup>

**Corresponding Author:** Prof. Benbo Zhao; Prof. Yunjun Luo

**Address:**

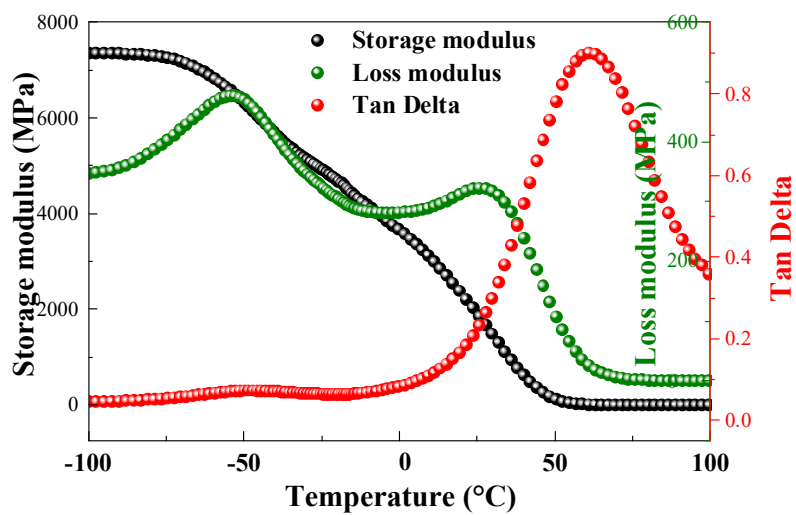
1 School of Chemical Engineering and Technology, North University of China, Taiyuan 030051, China

2 Dezhou Industrial Technology Research Institute of North University of China, Dezhou 253034, China

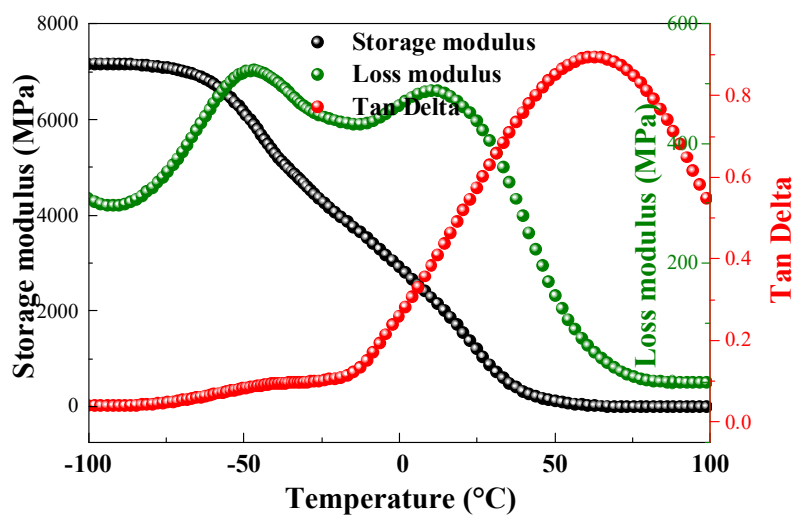
3 School of Materials Science and Engineering, Beijing Institute of Technology, 5 South Zhongguancun Street, Beijing 100081, China.

**Tel.:** +86-10-3922315; +86-10-68913698

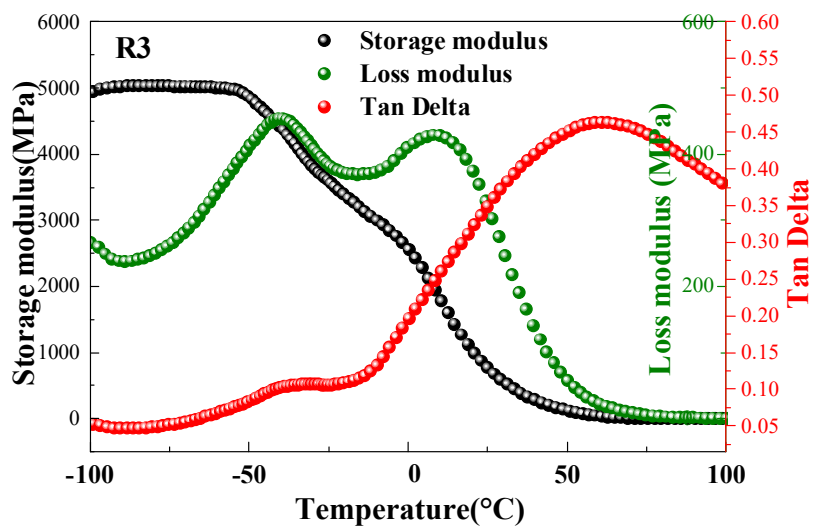
**E-mail:** zhaobenbo@163.com (B. Zhao); yjluo@bit.edu.cn (Y. Luo).



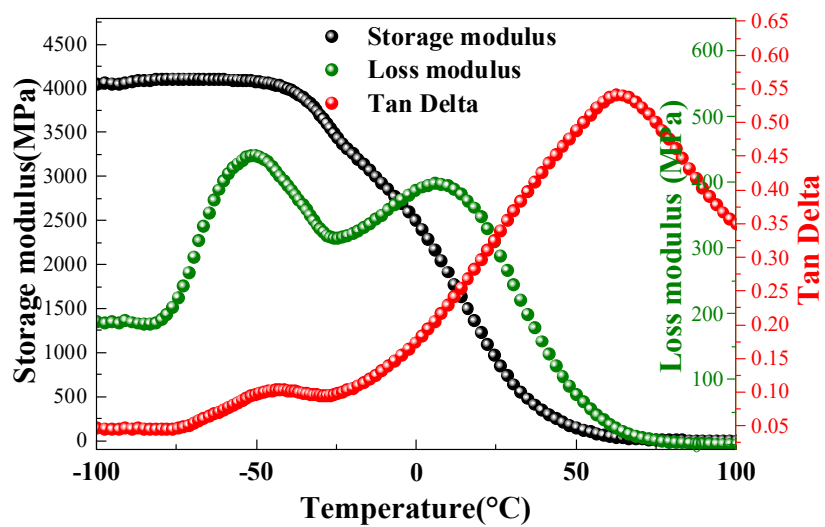
(a)



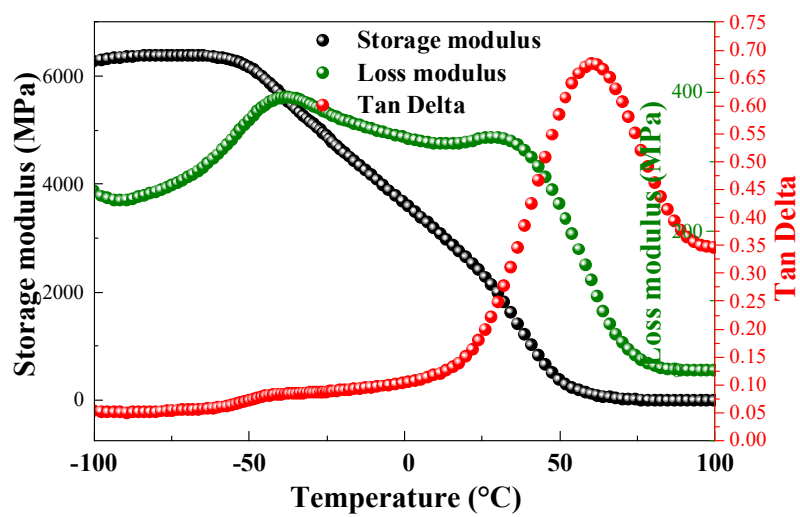
(b)



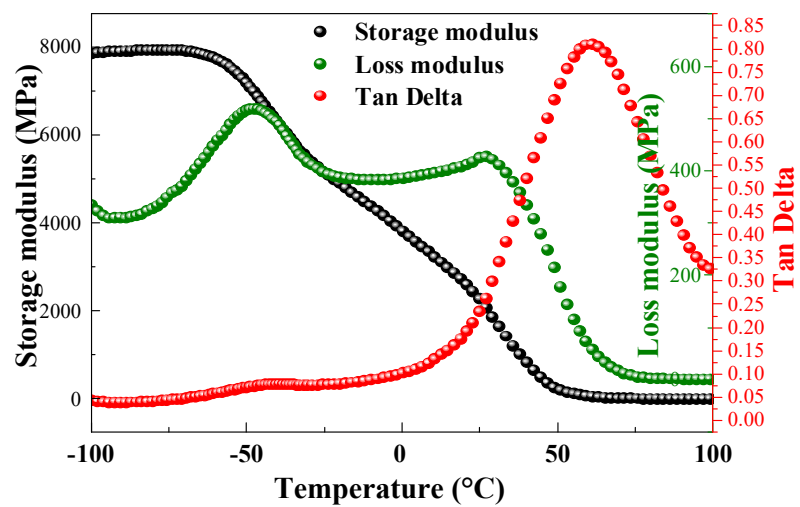
(c)



(d)



(e)



(f)

**Figure S1.** The  $E'$ ,  $E''$  and  $\tan\delta$  curves of R series propellants. (a) R1; (b) R2; (c)R3; (d) R4 (e) R5; (f)R6

**Table S1.** The mechanical properties of EMDB propellant plasticized by Bu-NENA.

Sample	−40°C		+20°C		+50°C	
	$\sigma_m$	$\epsilon_b$	$\sigma_m$	$\epsilon_b$	$\sigma_m$	$\epsilon_b$
R0	19.6	<b>3.54</b>	7.23	5.21	<b>1.22</b>	10.9
R1	21.0	7.85	5.83	11. 67	1.21	25.97
R2	20.6	7.57	5.28	10.87	1.13	23.03
R3	20.0	7.09	5.20	9.96	1.11	22.74
R4	19.6	4.85	4.86	8.69	1.05	18.52
R5	19.0	3.77	4.41	7.33	1.00	16.85
R6	18.1	3.52	4.22	5.99	0.92	15.82

**Table S2.** The transition temperature of EMDB propellant.

Sample/°C	$T_g$ /°C	$T_g$ /°C
R0	56.8	−33.8
R1	57.1	−39.5
R2	57.7	−38.6
R3	58.2	−38.1
R4	58.8	−37.8
R5	59.1	−37.3
R6	59.4	−36.8