

**New Technology for Preparing Energetic Materials by Nanofiltration  
Membrane (NF): Rapid and Efficient Preparation of High-purity  
Ammonium Dinitramide (ADN)**

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The standard ions of  $\text{DN}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ , and  $\text{SO}_4^{2-}$  were detected by ion chromatography, and the standard ion chromatograms of  $\text{DN}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ , and  $\text{SO}_4^{2-}$  were obtained. As shown in Figure S1, the retention times of  $\text{DN}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ , and  $\text{SO}_4^{2-}$  were 37.173 min, 10.497 min, 15.407 min, and 19.097 min, respectively. The retention times of each ion varied greatly, and the separation degree was high, which can be used for the detection of various ions in ADN mixed acid reaction solution. Meanwhile, based on the test results, the concentration conductivity standard curves of  $\text{DN}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ , and  $\text{SO}_4^{2-}$  were prepared, as shown in Figure S2. The linear correlation of this detection method is greater than 0.999, indicating a good linear correlation. This ion chromatography detection method can be used for purity and quantitative detection of ADN products.

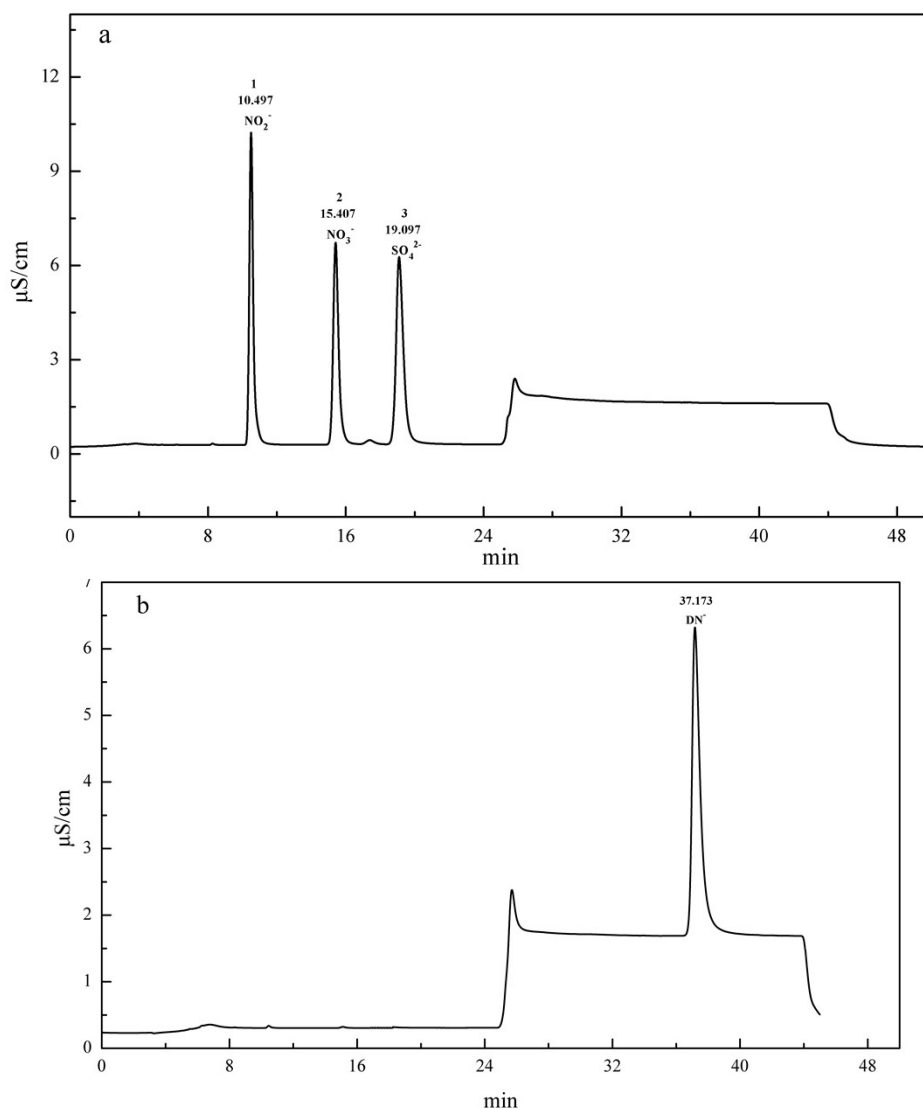
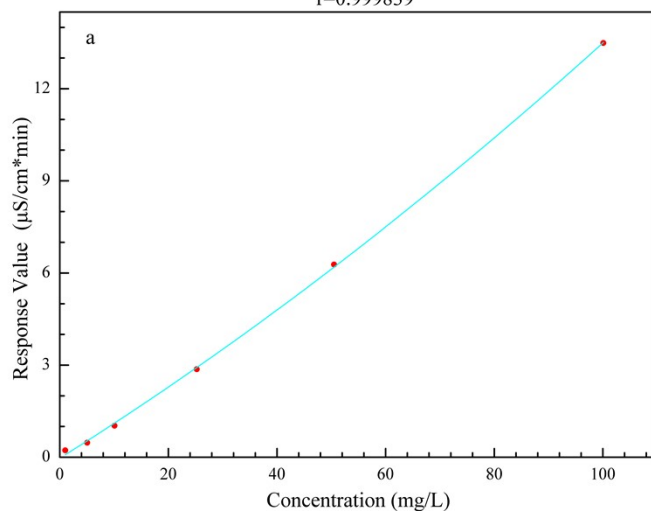
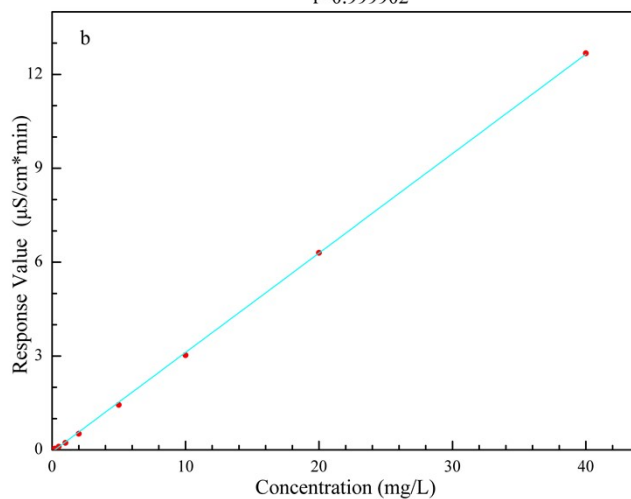


Fig. S1 The standard solution ion chromatogram of (a)  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$  and  $\text{NO}_2^-$  and (b)  $\text{DN}^-$ .

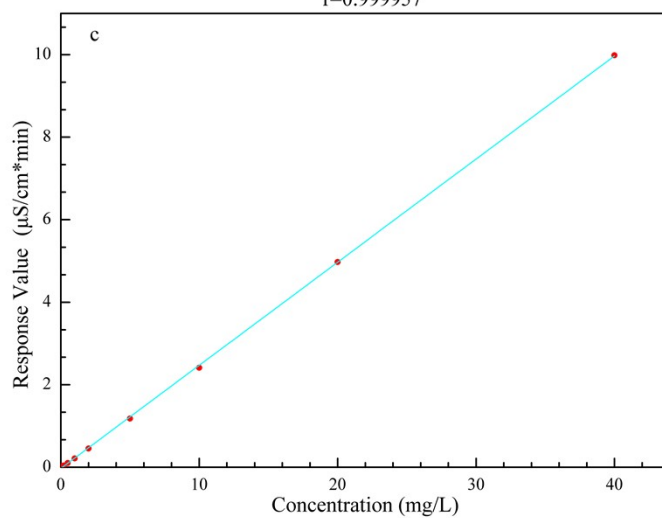
$$[\text{DN}^-] y=0.000242*x^2+0.111048*x-0.032933$$
$$r=0.999839$$



$$[\text{SO}_4^{2-}] y=0.317743*x-0.064775$$
$$r=0.999902$$



$$[\text{NO}_3^-] y=0.249903*x-0.028746$$
$$r=0.999957$$



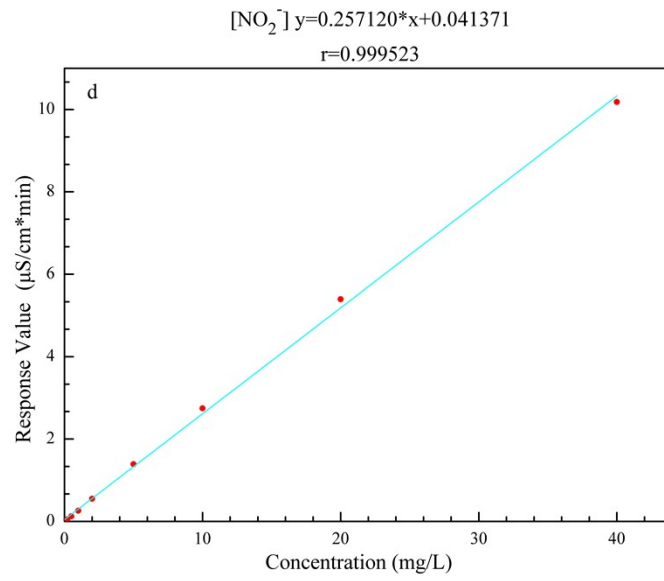
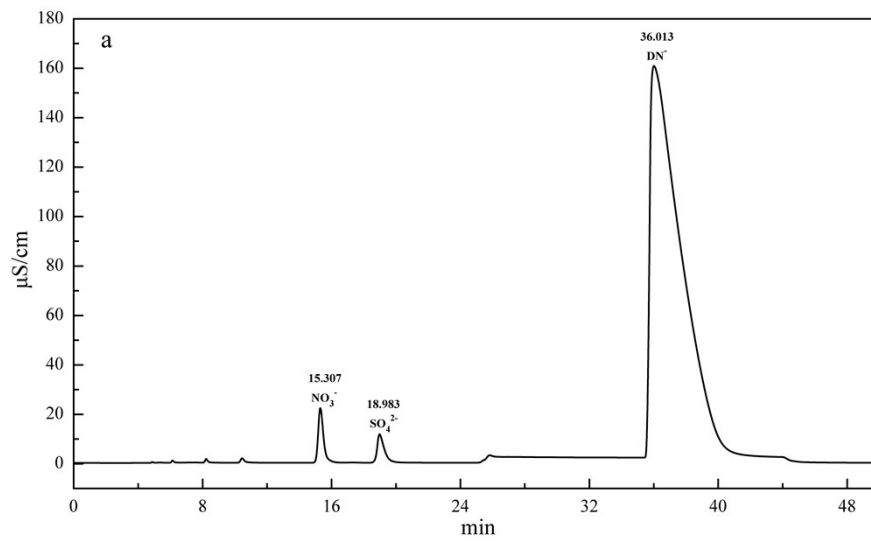
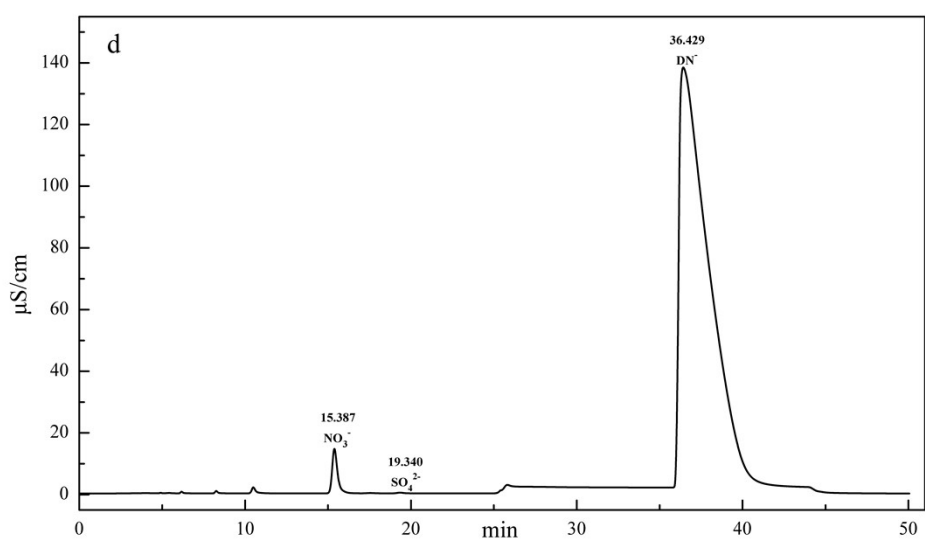
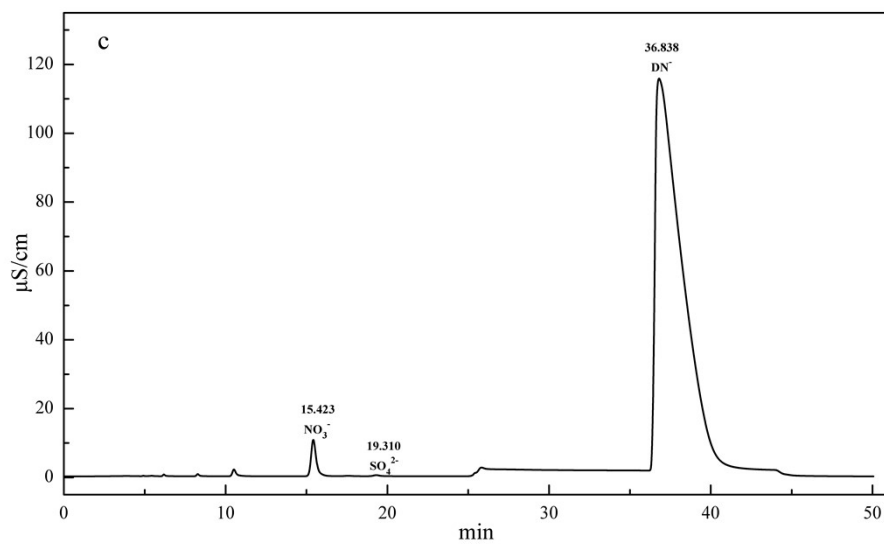
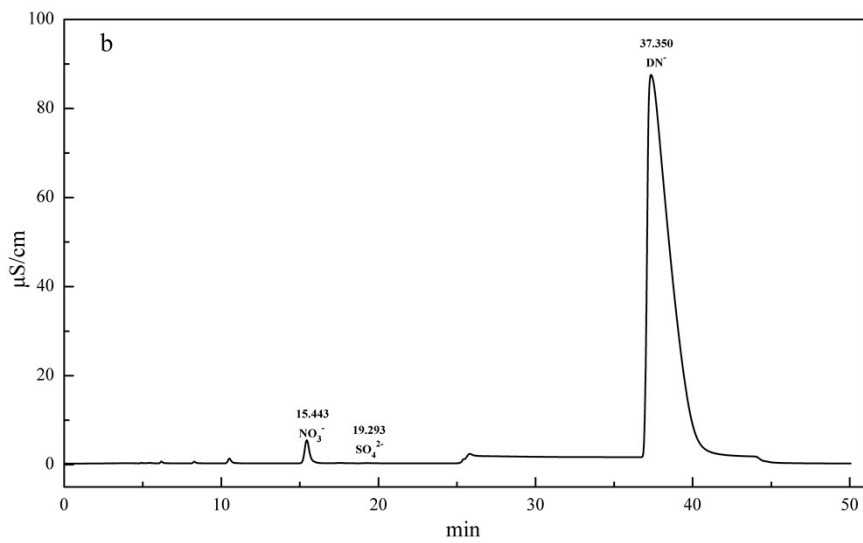


Fig. S2 The standard curve of (a)  $\text{DN}^-$ , (b)  $\text{SO}_4^{2-}$ , (c)  $\text{NO}_3^-$  and (d)  $\text{NO}_2^-$ .





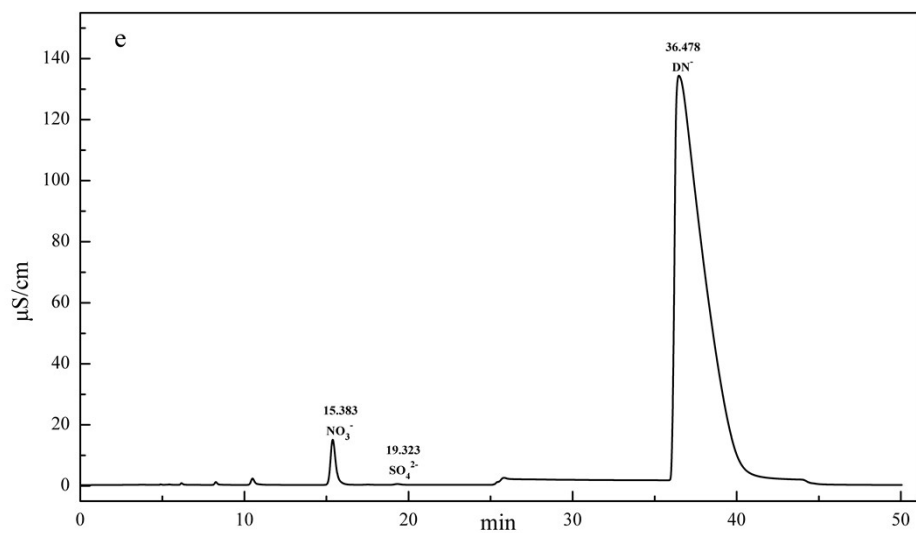


Fig. S3 Ion chromatogram of the raw synthetic solution (a), 200D (b), 400D (c), 600D (d) and 800D (e)

NFs permeate solution.