Supplementary materials for

**Synthesis and Physicochemical Properties of Hydrazides**

**of Malonic Acid with Different Substitutes**

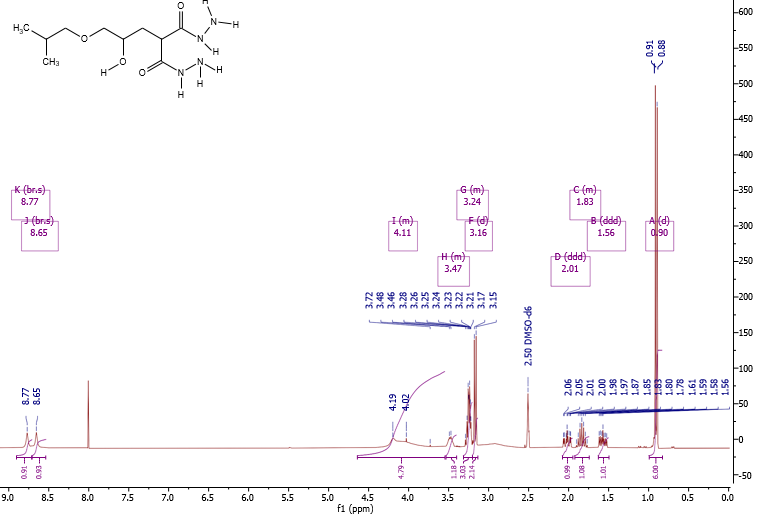
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**A.S. Galstyan, H․R. Sargsyan, H․H. Ghazoyan**

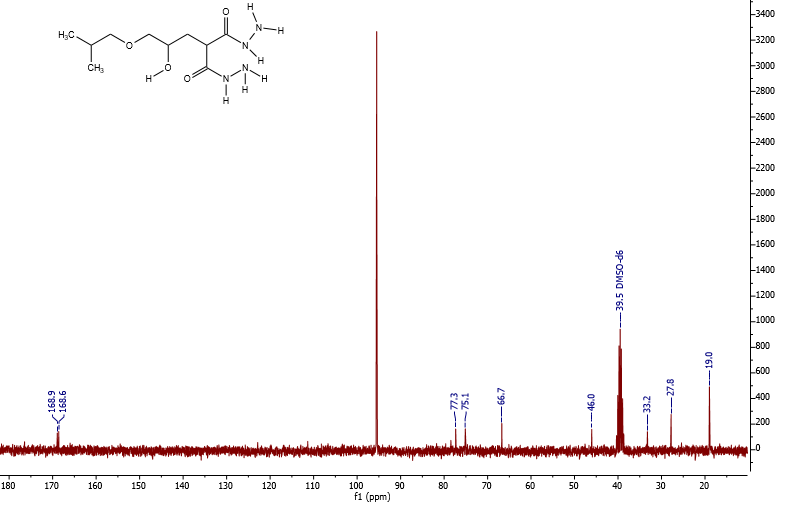
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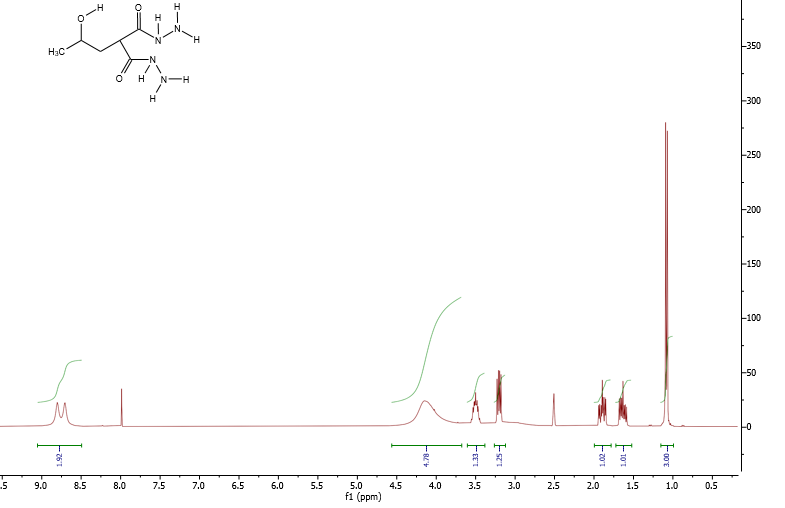
**Keywords:** Intramolecular cyclization; Hydrazide hydrates; Butanolide; Antioxidant activity

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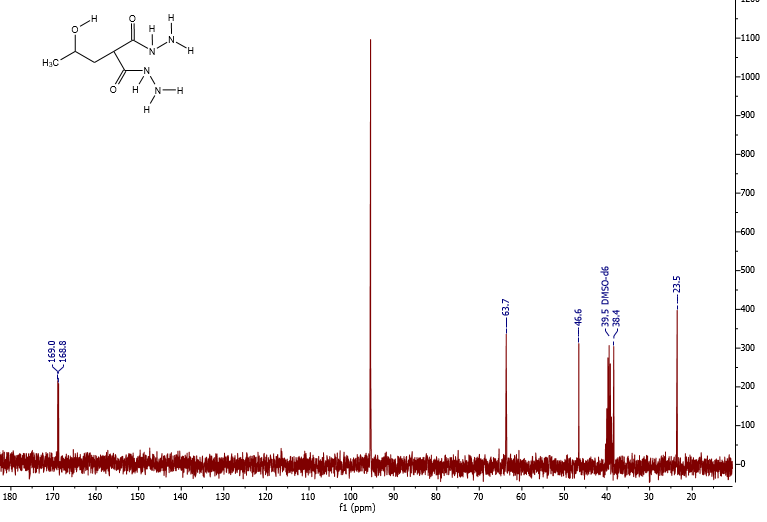
**Fig. S-1**. 1H–NMR-spectrum of **2a** (300 MHz, DMSO/CCl4 - 1/3).



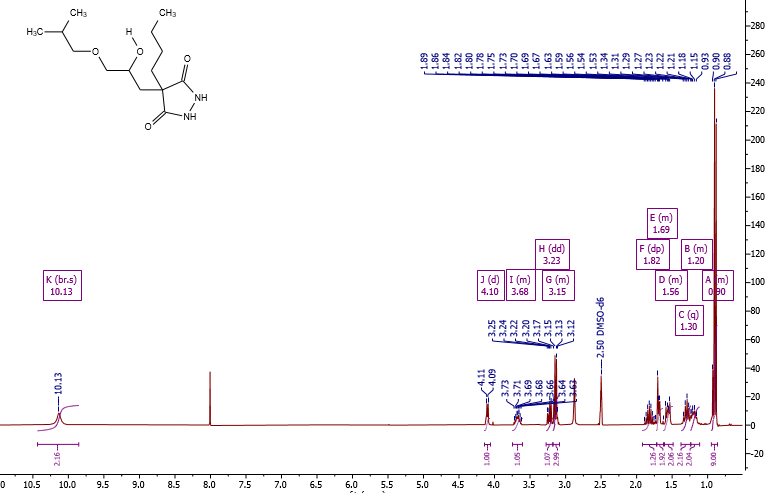
**Fig. S-2.** 13C-NMR-spectrum of **2a** (75 MHz, DMSO/CCl4 - 1/3).

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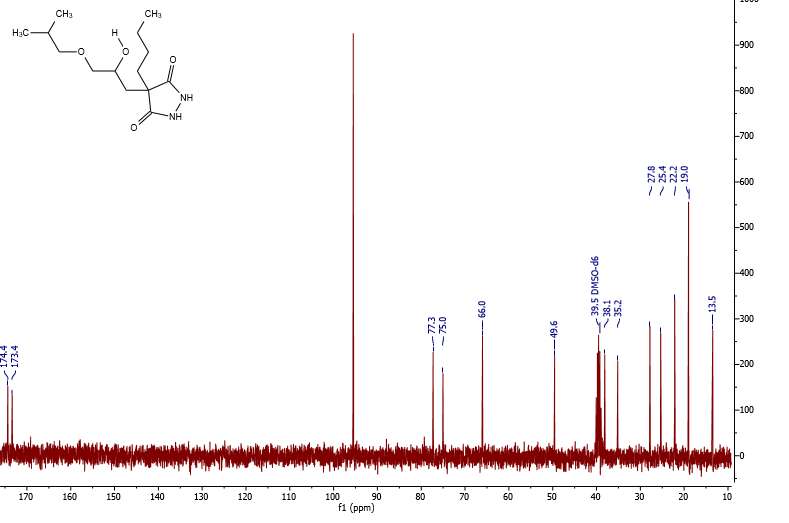
**Fig. S-3.** 1H–NMR-spectrum of **2b** (300 MHz, DMSO/CCl4 - 1/3).



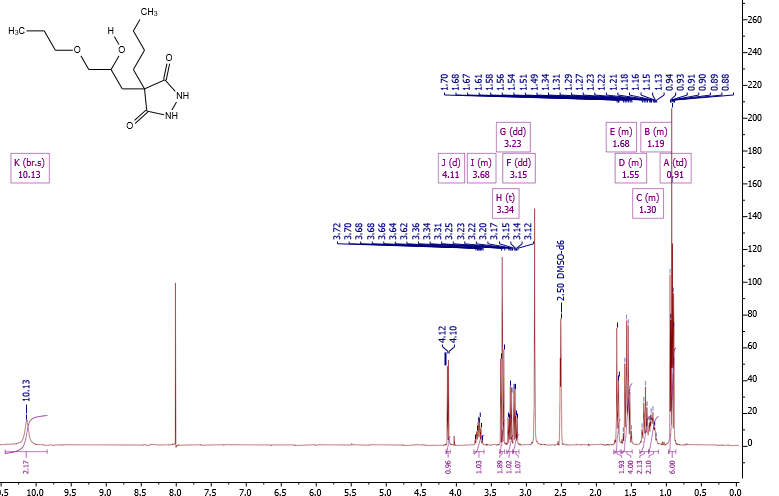
**Fig. S-4.** 13C-NMR-spectrum of **2b** (75 MHz, DMSO/CCl4 - 1/3).



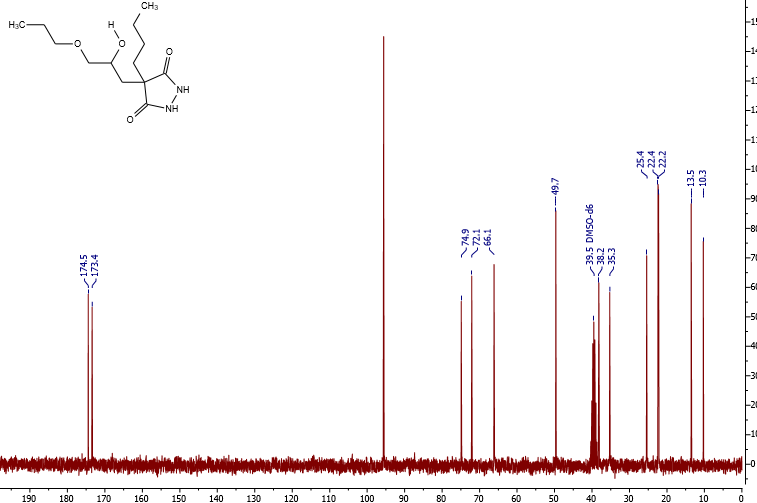
**Fig. S-5.** 1H- NMR-spectrum of **2c** (300 MHz, DMSO/CCl4 - 1/3).



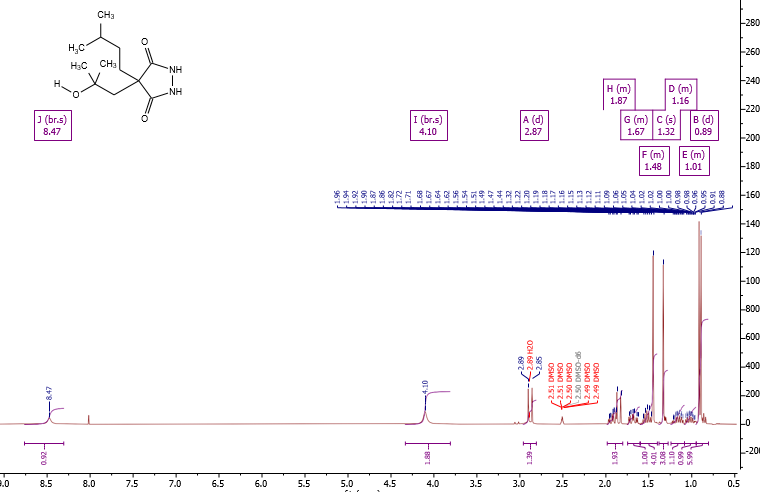
**Fig. S-6**. 13C- NMR-spectrum of **2c** (75 MHz, DMSO/CCl4 - 1/3).



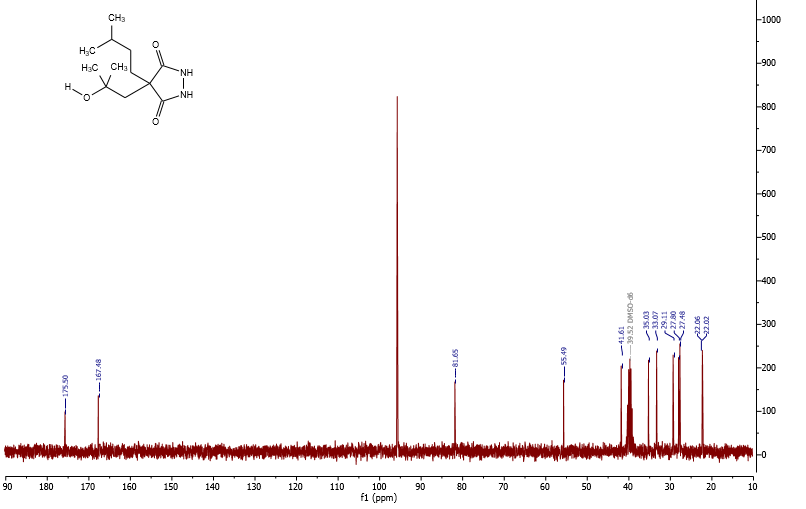
**Fig. S-7**. 1H-NMR-spectrum of **2d** (300 MHz, DMSO/CCl4 - 1/3).



**Fig. S-8.** 13C-NMR-spectrum of **2d** (75 MHz, DMSO/CCl4 - 1/3).



**Fig. S-9.** 1H –NMR-spectrum of **2e** (300 MHz, DMSO/CCl4 - 1/3).



**Fig. S-10.** 13C-NMR-spectrum of **2e** (75 MHz, DMSO/CCl4 - 1/3).



**Fig. S-11.** The intensity-weighted size distribution of **2a** at 298.15 K.



**Fig. S-12.** The intensity-weighted size distribution of **2b** at 298.15 K.



**Fig. S-13.** The intensity-weighted size distribution of **2c** at 298.15 K.



**Fig. S-14.** Absorption of PNDMA vs time of radiation of hydrogen peroxide at the presence of **2a.**

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**Fig. S-15.** Absorption of PNDMA vs time of radiation of hydrogen peroxide at the presence of **2b**.



**Fig. S-16.** Absorption of PNDMA vs time of radiation of hydrogen peroxide at the presence of **2c.**



**Fig. S-17**. Absorption of PNDMA vs time of radiation of hydrogen peroxide at the presence of **2d**.

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**Fig. S-18.** Absorption of PNDMA vs time of radiation of hydrogen peroxide at the presence of **2e**.