

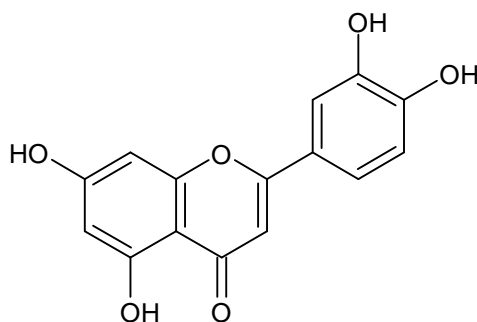


## Test Report

**Sample name:** Alpha-lipoic acid  
**Client:** Hansen Sp. z o.o., ul. Zaborowska 8, 05-083 Zaborów, Poland  
**Purpose of test:** Verification of delivered product  
**Sample description:** Resveratrol  
**Brand name:** Hansen Supplements

### Description of substance:

**Sample size:** 10g  
**Property:** Pale-yellow powder  
**Formula:** C<sub>15</sub>H<sub>10</sub>O<sub>6</sub>  
**CAS number:** 491-70-3  
**Structure:**



**Batch No.:** 030295230131  
**Date received:** 15.02.2023  
**Test items:** Identification of substance, purity, heavy metals  
**Summary:** The sample has been identified and found to be of high quality  
**Measured purity:** **Above 94%** according to <sup>1</sup>H NMR analysis. Appropriate spectra are shown in (Fig. 2 and 3).



Authentication method: Standard and literature  $^1\text{H}$  and  $^{13}\text{C}$  shifts (Fig. 2 and 3) are in statement with Kumar, Vikesh. "Structural Characterization of Luteolin Glycosides Flavonoids from Indian Plantation White Sugar." Oriental Journal of Chemistry 36, no. 4 (2020): 773 and Burns, Darcy C., David A. Ellis, and Raymond E. March. "A predictive tool for assessing  $^{13}\text{C}$  NMR chemical shifts of flavonoids." Magnetic Resonance in Chemistry 45, no. 10 (2007): 835-845.

**All values are within the relevant standards**

**Test results:**

**Purity:**

Heavy metals: n.d.

Pb (Lead): n.d.

Hg (Mercury): n.d.

Cd (Cadmium): n.d.

As (Arsen): n.d.

**Comments:**

n.d. – not detected, below limit of detection on AAS pectr AA240FS + AA240Z + GTA120

**Date:** 20.04.2023

**Tested by:** Antoni Szumny

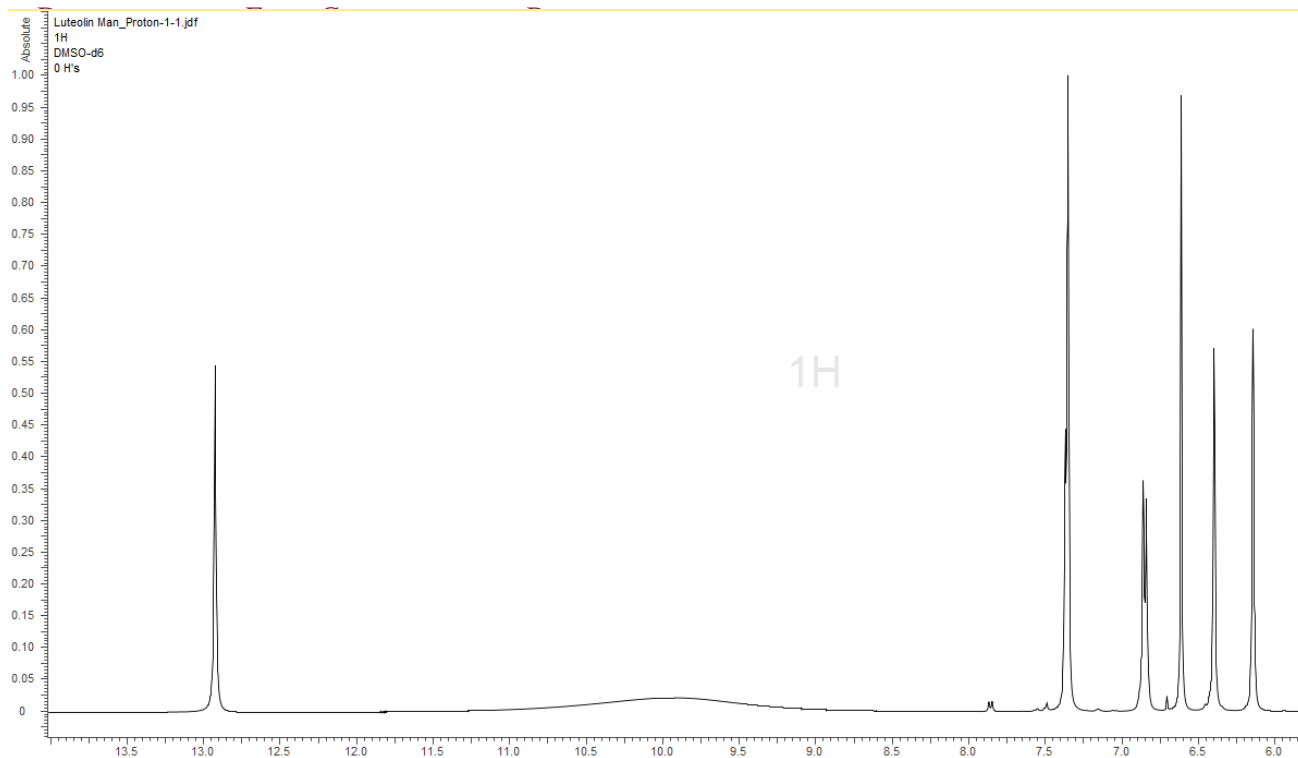


Figure 2.  $^1\text{H}$  spectrum of  $\alpha$ -lipoic acid , batch No. 030295230131 of (inDMSO);

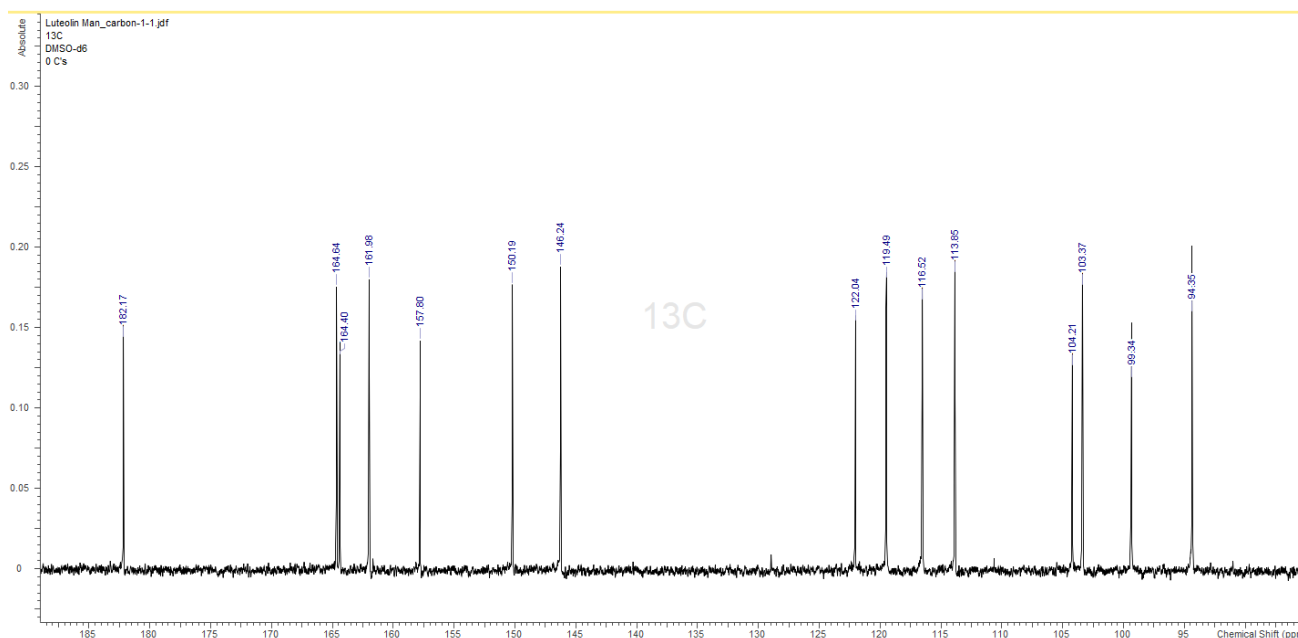


Figure 1. Figure 2.  $^{13}\text{C}$  spectrum of  $\alpha$ -lipoic acid , batch No. 030295230131of (in DMSO);



WROCLAW UNIVERSITY  
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AND LIFE SCIENCES

DEPARTMENT OF FOOD CHEMISTRY AND BIOCATALYSIS

20.04.2023 Antoni Szumny

A handwritten signature in blue ink, appearing to read 'AS', with a long horizontal line extending to the right.