SUPPLEMENTARY DATA

S-1. SYNTHESIS OF STEROIDAL BLOCKS 12 AND 17 .

S-1.1. Synthesis of compounds 9 *and* 14.

The mixture of testosterone **8** or dihydrotestosterone **13** (2 mmol), dry ethylene glycol (6 mL) and dry benzene (25 mL) was refluxed for 15 min, followed by slow distillation ≈ 10 mL of solvent; thereafter pTSA (28 mg, 0.15 mmol) and dry benzene (10 mL) were added. The mixture was refluxed at strring in the flask equipped with a Dean-Stark trap for 10 h, the formation of ethylene ketal **5a** being monitored by TLC in hexane-ethyl acetate (2:1) system. Then benzene was distilled off, the residue was treated with saturated $NaHCO_3$ solution (25 mL) and extracted with CH_2Cl_2 (2 X 30 mL). Extract was dried over Na_2SO_4, evaporated, the residue was purified by silica gel flash chromatography in hexane- ethyl acetate (2 : 1) system, followed by crystallization from EtOH - water mixture to obtain target product.

S-1.2. 3,3-Ethylenedioxyandrost-5-en-17β-ol 9.

Compound **9** (480 mg, 1.44 mmol, 72 %), white crystals with m. p. 184^{o}C (lit 183^{o}C [S.1]). HRMS, calculated for $C_{21}H_{33}O_3^+$: 333.2430, found: 333.2428; ^{1}H NMR: 0.76 (3H, s, H-18); 1.03 (3H, s, H-19); 2.57 (1H, ddd, J = 2.6 Hz, J = 5.3 Hz, J = 14.5 Hz, H-4); 3.64 (1H, t, J = 8.5 Hz, H-17α); 3.93 (4H, br s, 3,3-ethylenedioxy CH_2); 5.34 (m, 1 H, H-6); ^{13}C NMR: 11.1; 19.0; 20.8; 23.6; 30.6; 31.2; 31.5; 32.1; 36.5; 36.7; 36.8; 41.9; 42.9; 49.9; 51.4; 64.3; 64.5; 82.0; 109.5; 121.9; 140.4.

S-1.3. 3,3-Ethylenedioxyandrostan-17β-ol 14.

Compound **14** (610 mg, mmol, 91 %), white crystals with m.p. 179^{o}C. HRMS, calculated for $C_{21}H_{35}O_3^+$: 335.2586; found: 335.2584; ^{1}H NMR: 0.72 (3H, s, H-18), 0.81.(3H, s, H-19), 3.62 (1H, t, J = 8.5 Hz, H-17α), 3.92 (4H, br. s, 3,3-ethylenedioxy CH_2); ^{13}C NMR: 11.2; 11.5; 20.9; 23.5; 28.6; 30.7; 31.3; 31.6; 35.7; 35.7; 36.9; 38.1; 43.1; 43.9; 51.2; 54.3; 64.2; 82.1; 109.5.

S-1.4. Synthesis of compounds 10 *and* 15.

To the solution of compound **9** or **14** (1.4 mmol) in dry CH_2Cl_2 (25 mL) PCC (645 mg, 3.0 mmol) was added in one portion and the mixture was stirred at room temperature for 1 h, diluted with $CHCl_3$ (50 mL), and filtered through celite pad. The solution was washed with saturated $NaHCO_3$ solution (20 mL), then with brine (20 mL), dried over Na_2SO_4, evaporated and passed through short silica gel column in hexane-ethyl acetate (2 : 1) mixture to obtain target product.

***S-1.5. 3,3-Ethylenedioxyandrost-5-en-17-one* 10.**

Compound **10** (414 mg, 1.25 mmol, 89%) was obtained as white solid. After crystallization from MeOH : H_2O (3:1) mixture – white crystals with m.p.: 197°C (lit. 197°C-199°C [S.1]); HRMS, calculated for $C_{21}H_{31}O_3^+$: 331.2273; found: 331.2268; ^{1}H NMR: 0.88 (3H, s, H-18); 1.04 (3H, s, H-19, 2.57 (1H, ddd, J = 2.6 Hz, J = 5.3 Hz, J = 14.5 Hz, H-4); 3.93 (4H, m, 3,3-ethylenedioxy CH_2); 5.36 (m, 1 H, H-6); ^{13}C NMR: 13.4; 19.0; 20.5; 22.0; 30.8; 31.1; 31.6; 31.7; 35.9; 36.4; 36.9; 41.9; 47.6; 50.0; 51.9; 64.3; 64.5; 109.4; 121.5; 140.6; 221.1

***S-1.6. 3,3-Ethylenedioxyandrostan-17-one* 15.**

Compound **15** (533 mg, 1.6 mmol, 88 %) was obtained as white crystals with m.p. 155°C {from MeOH : H_2O (3:1) mixture, lit. 153°C[S.1]}. HRMS, calculated for $C_{21}H_{33}O_3^+$: 333.2430; found: 333.2428; ^{1}H NMR: 0.86 and 0.88 (each 3H, s, H-18 and H-19), 3.92 (4H, 3,3-ethylenedioxy CH_2); ^{13}C NMR: 11.5; 13.9; 20.6; 21.9; 28.4; 30.9; 31.2; 31.7; 35.2; 35.7; 35.9; 36.1; 38.1; 43.8; 47.9; 51.6; 54.3; 64.3; 109.9; 221.3.

***S-1.7. Synthesis of compounds* 11 *and* 16.**

The mixture of freshly activated Zn chips (1.20 g, 18.5 mg-atom), 17-ketosteroid **10** or **15** (1.2 mmol), abs. benzene (8 mL), and one crystal of iodine was heated to 50°C at vigorous stirring. Ethyl bromoacetate (400 µL, 3.6 mmol) was added by drops, and the mixture was heated under reflux and stirring for 1.h, then additional ethyl bromoacetate (200 µL, 1.8 mmol) was added and the mixture was heated under reflux and stirring for 30 min more. After cooling the mixture was diluted with benzene (20 mL) and diethyl ether (30 mL), the zinc complex was decomposed by addition of 10% aqueous CH_3COOH, aqueous layer was extracted with diethyl ether (2 X 20 mL), the combined benzene-ether extract was washed with saturated $NaHCO_3$ solution (30 mL), brine (20 mL), dried over Na_2SO_4 evaporated and isolated by flash chromatography in hexane-ethyl acetate (4 : 1) mixture as colorless glass, which crystallized during the storage.

***S-1.8. Ethyl 3,3-ethylenedioxy-17β-hydroxypregn-5-en-21-oate* 11.**

Compound **11** (425 mg, 1.01 mmol, 84 %). HRMS, calculated for $[C_{25}H_{39}O_5]^+$: 419.2797, found: 419.2796; ^{1}H-NMR: 0.91 (3H, s, H-18); 1.03 (3H, s, H-19); 1.28 (3H, t, J = 7.2 Hz, ethyl); 3.93 (4H, m, 3,3-ethylenedioxy CH_2); 4.16 (2H, q, J = 7.2 Hz, ethyl); 4.24 (1H, br. s, 17-OH); 5.33 (1H, m, H-6). ^{13}C-NMR: 14.2; 14.3; 19.0; 20.9; 24.0; 31.2; 31.8; 32.4; 32.9; 36.5; 36.9; 37.4; 41.8; 46.4; 49.8; 51.4; 61.0; 64.4; 64.6; 81.9; 109.6; 121.9; 140.4; 174.5.

***S-1.9. Ethyl 3,3-ethylenedioxy-17β-hydroxypregnan-21-oate* 16.**

Compound **15** (505 mg, 1.2 mmol, 80 %) HRMS, calculated for $[C_{25}H_{41}O_5]^+$: 421.2954, found: 421.2953; ^{1}H-NMR: 0.81 (3H, s, H-18); 0.88 (3H, s, H-19); 1.28 (3H, t, J = 7.2 Hz, ethyl); 2.43 and 2.58 (each 1H, d, J = 16 Hz, H-20); 3.92 (4H, m, 3,3-ethylenedioxy CH_2); 4.17 (2H, q, J = 7.2 Hz, ethyl); 4.28 (1H, br. s, 17-OH);. ^{13}C NMR: 11.5; 14.2; 15.7; 21.0; 23.7; 28.6; 30.6; 31.2; 31.8; 32.0; 32.5; 35.9; 36.2; 36.3; 37.3; 38.1; 41.7; 43.9; 51.0; 54.1; 60.8; 64.2; 81.8; 109.4; 174.4.

***S-1.10. Synthesis of compounds* 12 *and* 17.**

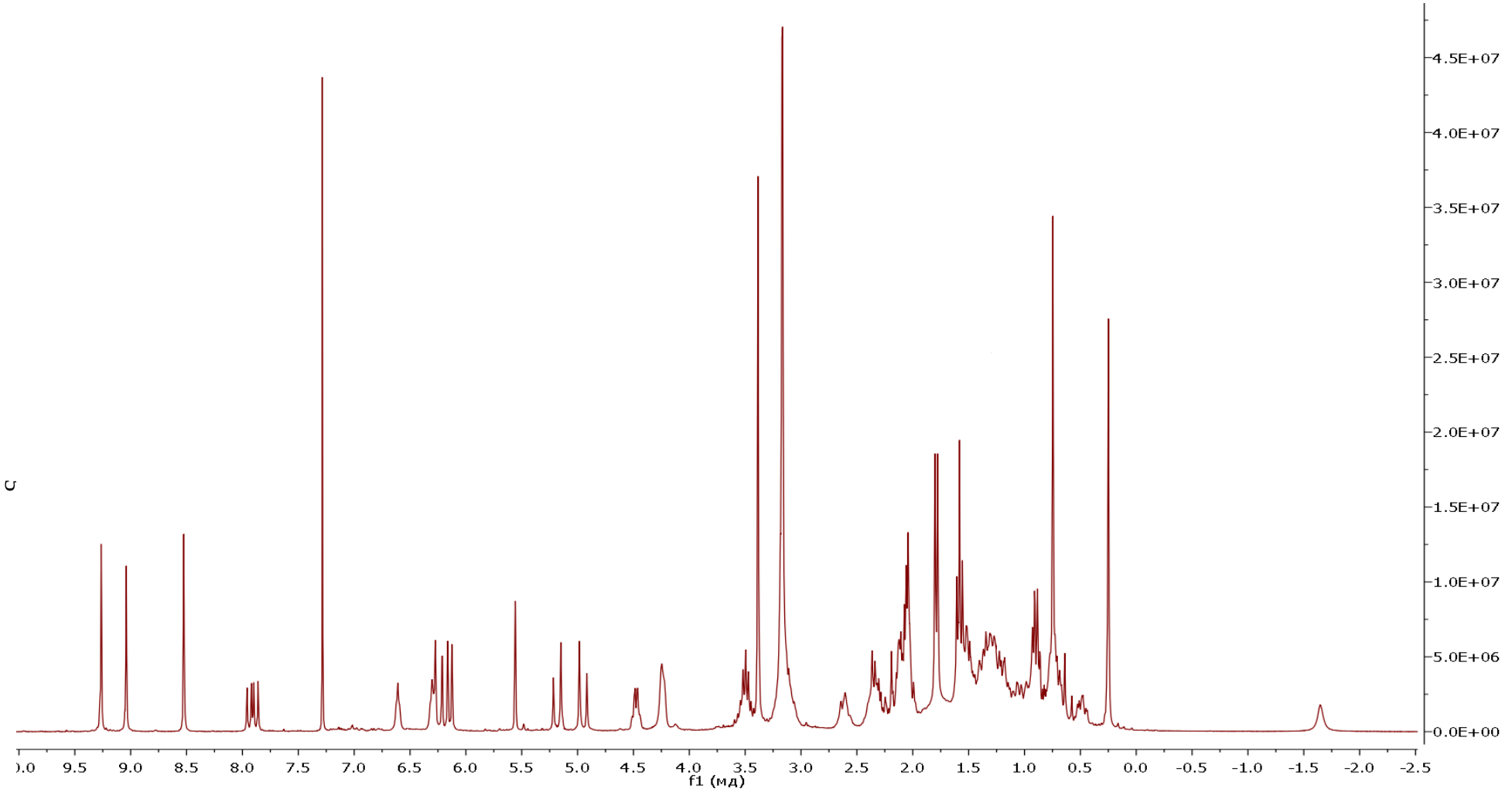
Ethyl ester **11** or **16** (1.0 mmol) was dissolved in 10 mL of mixture MeOH : THF : 2N H_2SO_4 (15 : 10 : 2, by vol.) and stored at r. t. for 3.5 h, then $NaHCO_3$ saturated solution (10 mL) and $CHCl_3$ (30 mL) were added, aqueous layer was extracted with $CHCl_3$ (20 mL); the combined chloroform extract was washed with brine (15 mL), dried over Na_2SO_4 and evaporated to dryness. The residue was stirred with 25 mL of mixture MeOH : H_2O : 4N NaOH (9 : 6 : 1, by vol.) at r. t. until the hydrolysis was complete (≈ 3.5 h). Then the mixture was acidified with diluted aqueous HCl to pH 2 and extracted with $CHCl_3$ (3 X 20 mL). The chloroform extract was dried over Na_2SO_4 and evaporated to dryness to obtain target products.

***S-1.11. 17β-Hydroxy-3-oxopregn-4-en-21-oic acid* 12.**

Compound **12** (316 mg, 0.91 mmol, 91 %) was obtained as white solid foam. HRMS, calculated for $[C_{21}H_{31}O_4]^+$: 347.2222, found: 347.2221; ^{1}H-NMR: 0.95 (3H, s, H-18); 1.19 (3H, s, H-19); 2.51 and 2.65 (each 1H, d, J = 16 Hz, H-20); 5.73 (1H, s, H-4); ^{13}C-NMR: 14.1; 17.7; 20.9; 23.7; 29.9; 31.8; 32.2; 32.9; 34.0; 35.9; 36.5; 37.4; 38.8; 41.5; 46.5; 50.4; 53.8; 82.1; 124.1; 171.4; 199.9.

***S-1.12. 17β-Hydroxy-3-oxopregnan-21-oic acid* 17.**

Compound **17** (314 mg, 0.9 mmol, 90 %) was obtained as white solid foam**.** HRMS, calculated for $[C_{21}H_{33}O_4]^+$: 349.2378, found: 349.2378; ^{1}H-NMR: 0.92 (3H, s, H-18); 1.01 (3H, s, H-19); 2.51 and 2.66 (each 1H, d, J = 16 Hz, H-20); ^{13}C NMR: 11.6; 14.1; 14.4; 21.2; 23.7; 28.9; 31.5; 32.2; 35.8; 36.2; 37.4; 38.2; 38.6; 41.6; 44.7; 46.6; 46.8; 50.7; 53.7; 82.3; 176.1; 212.1.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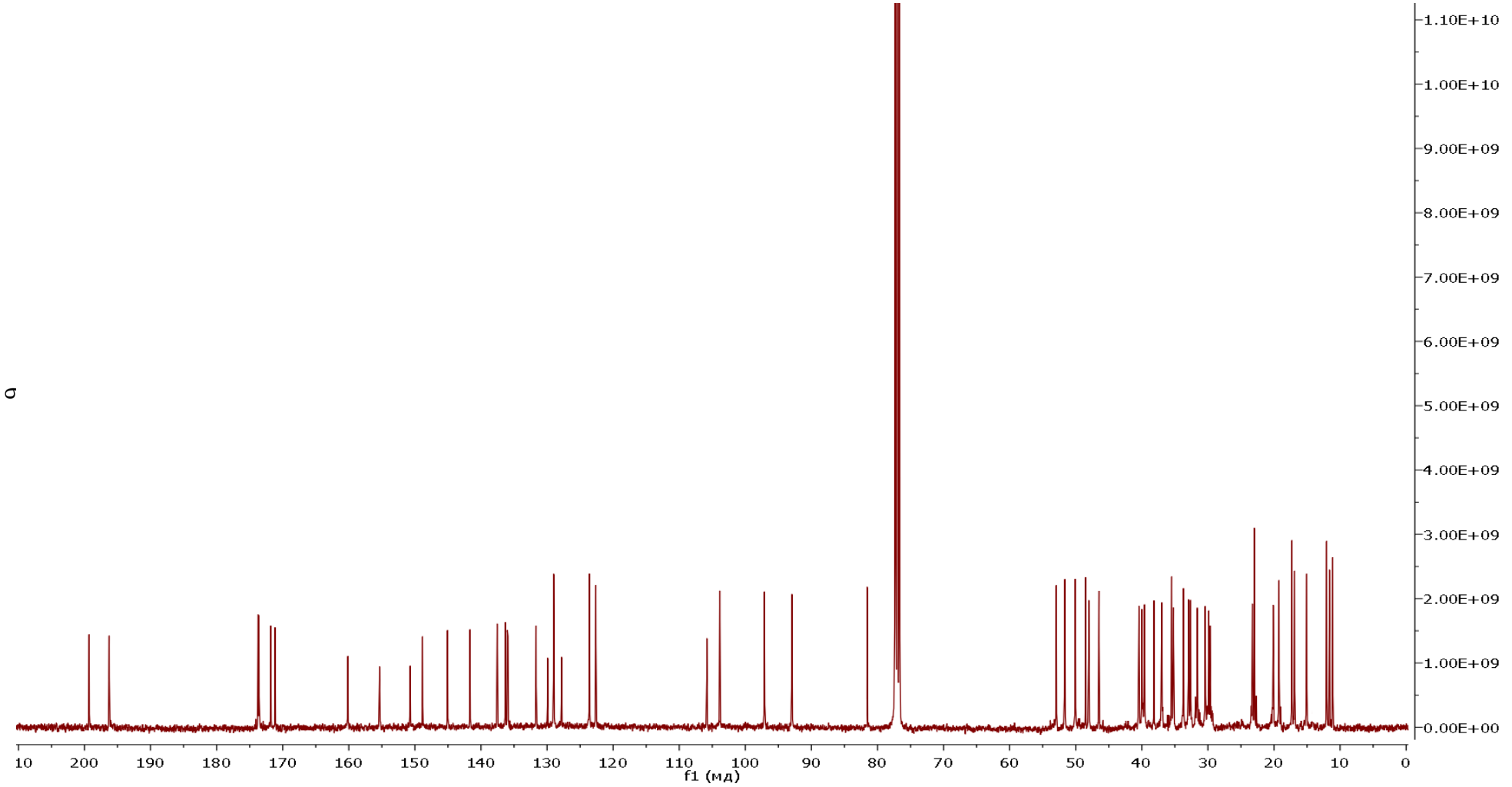
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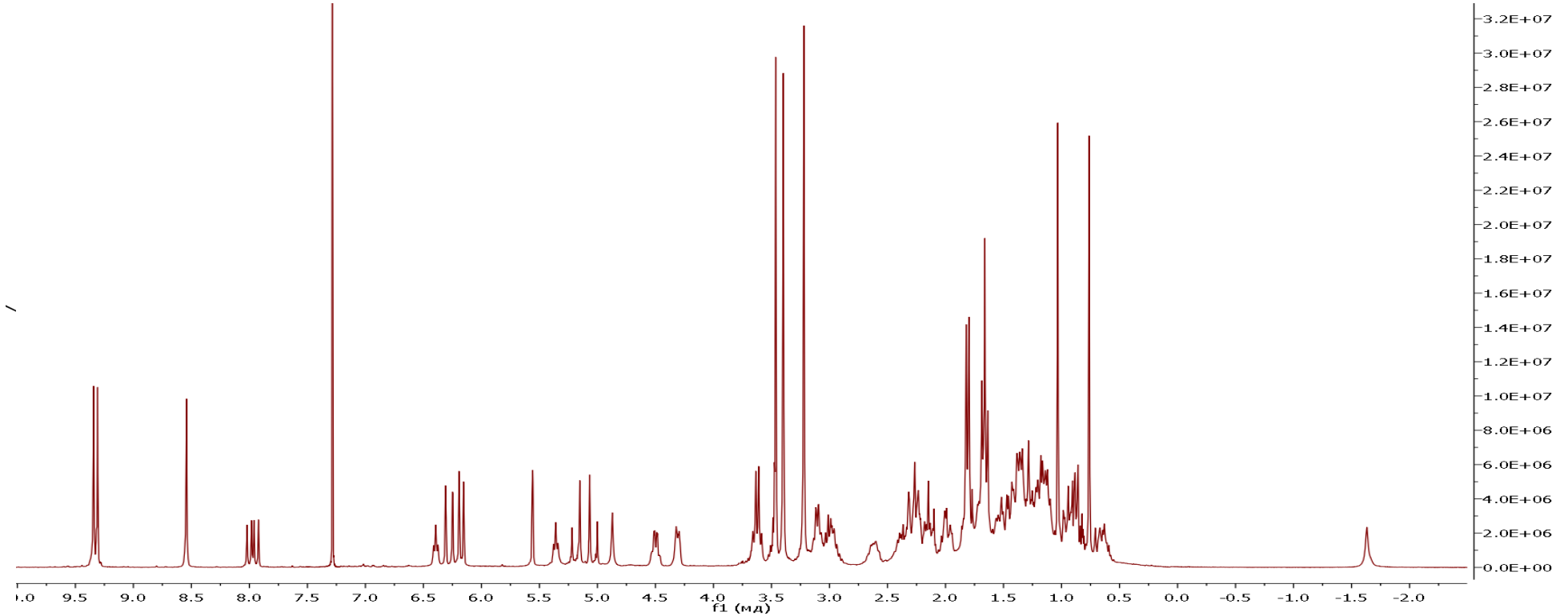
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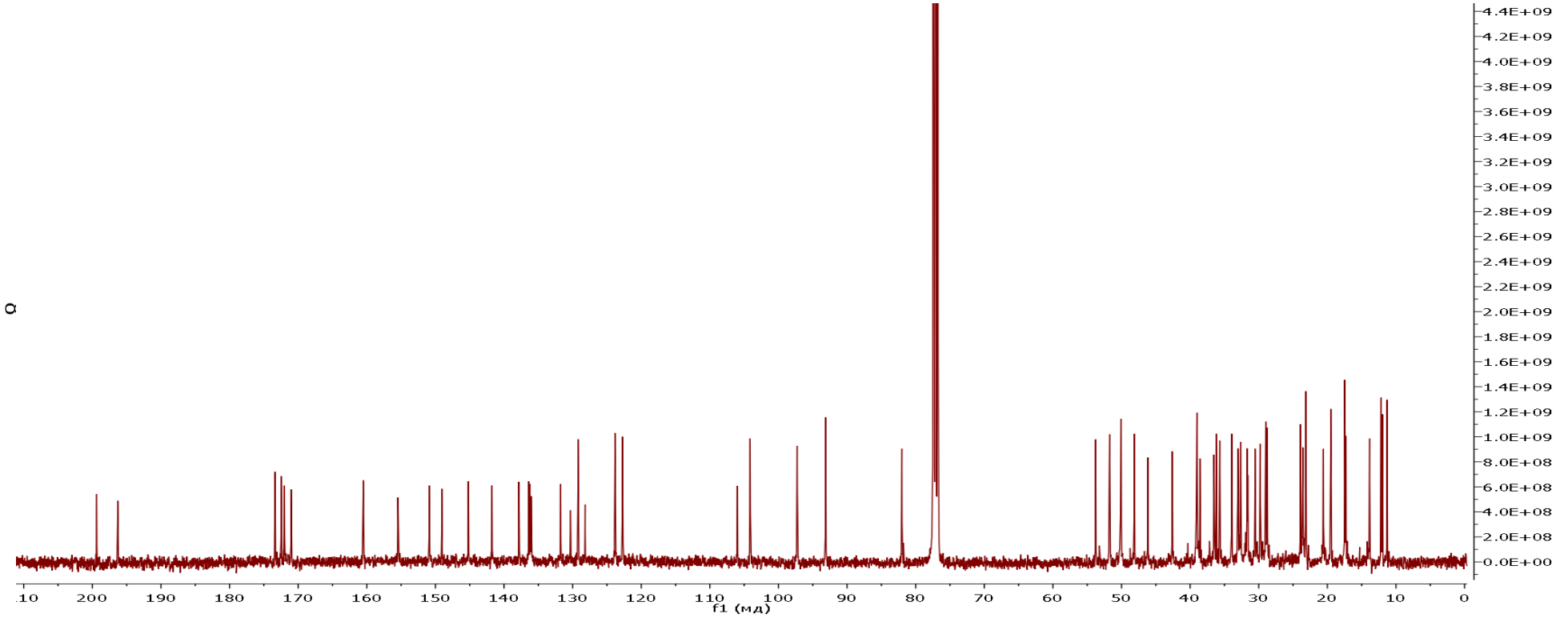
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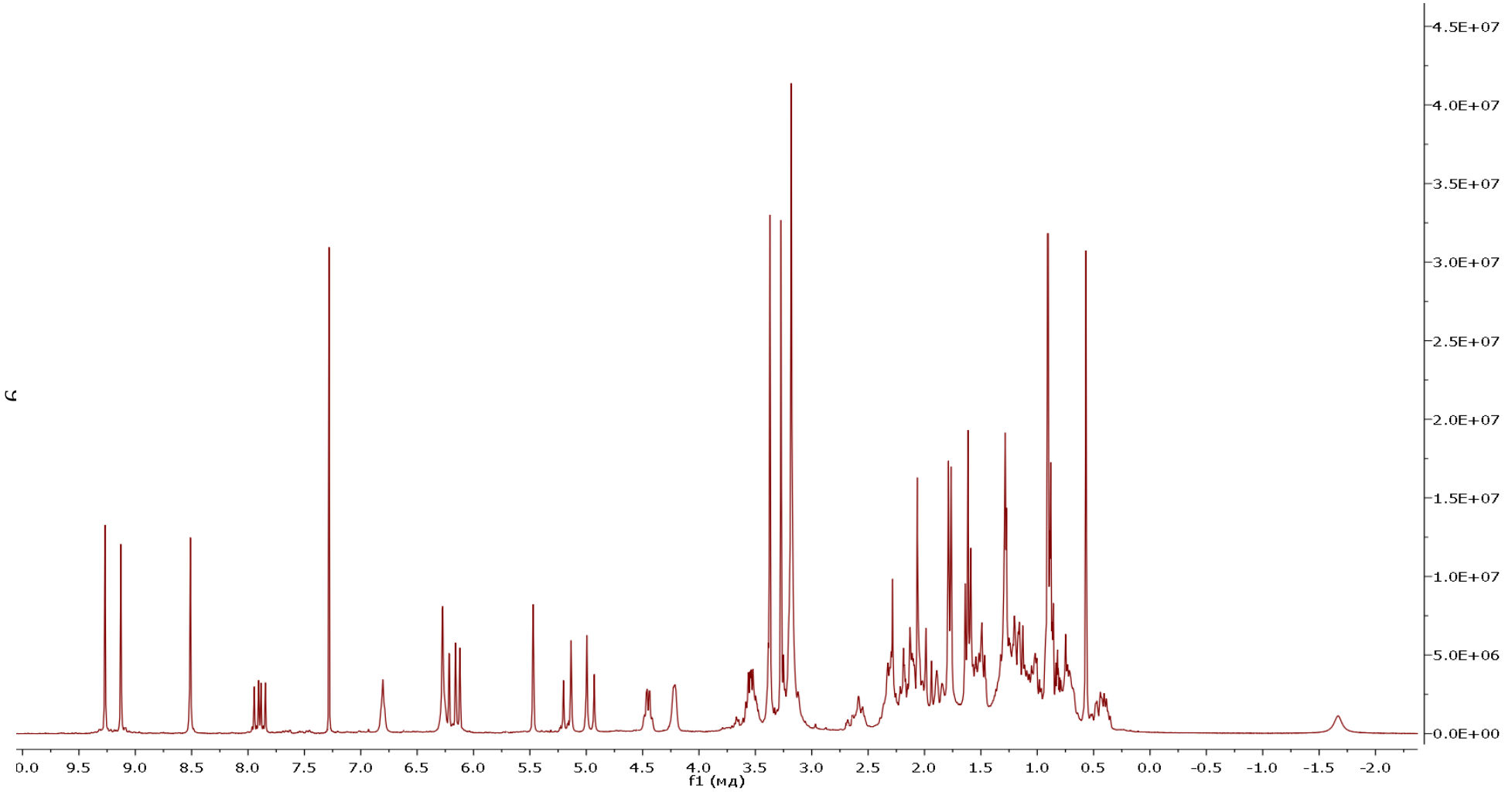
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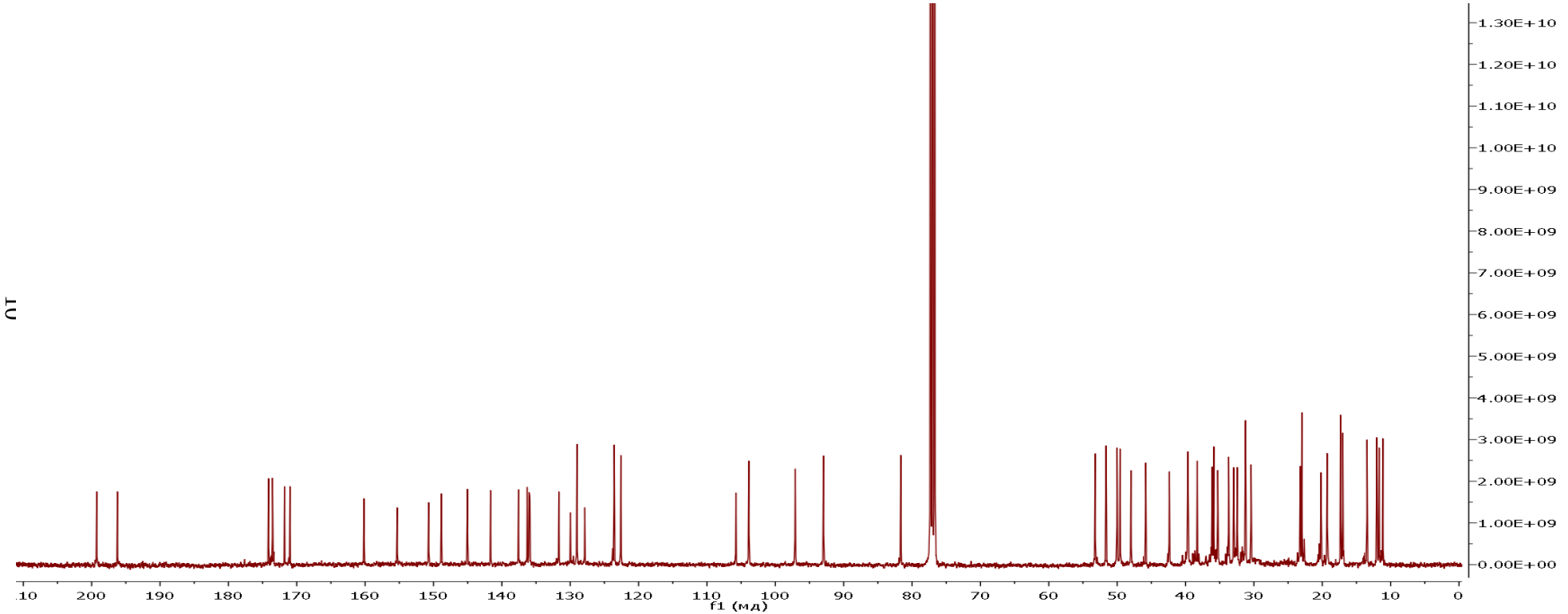
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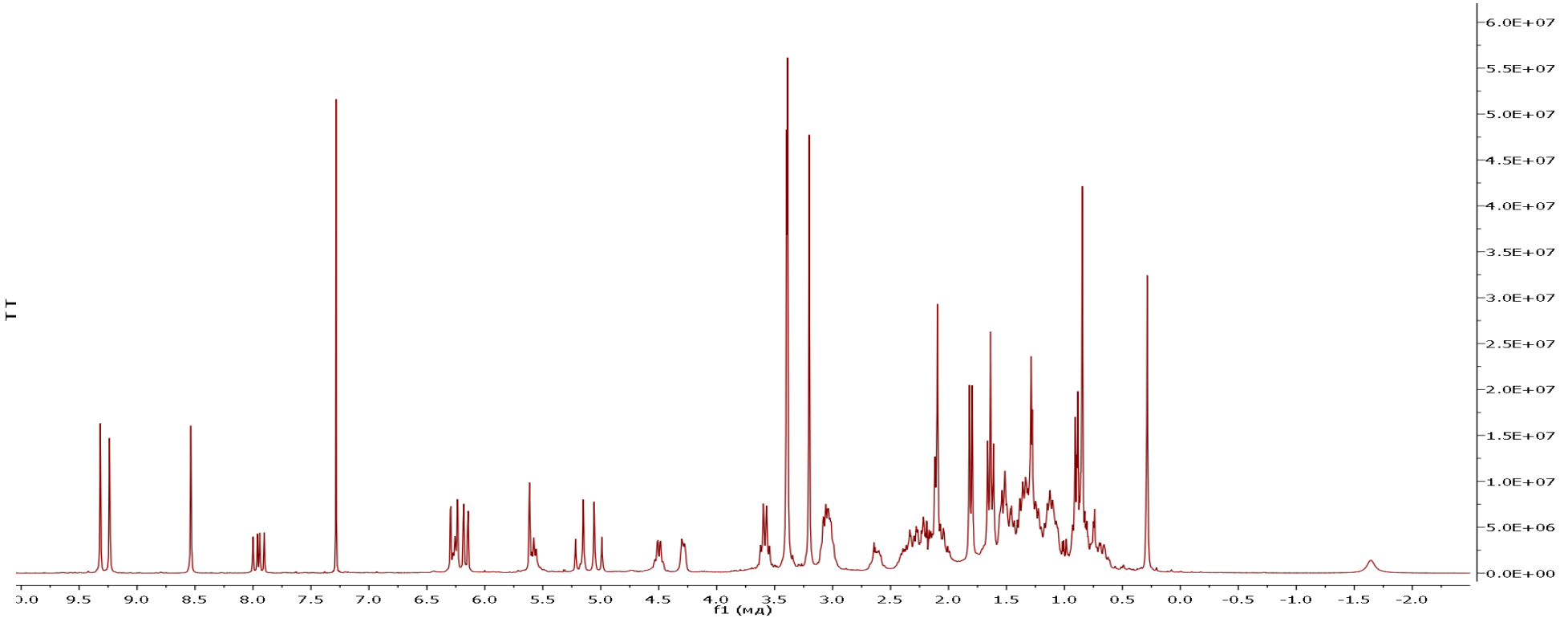
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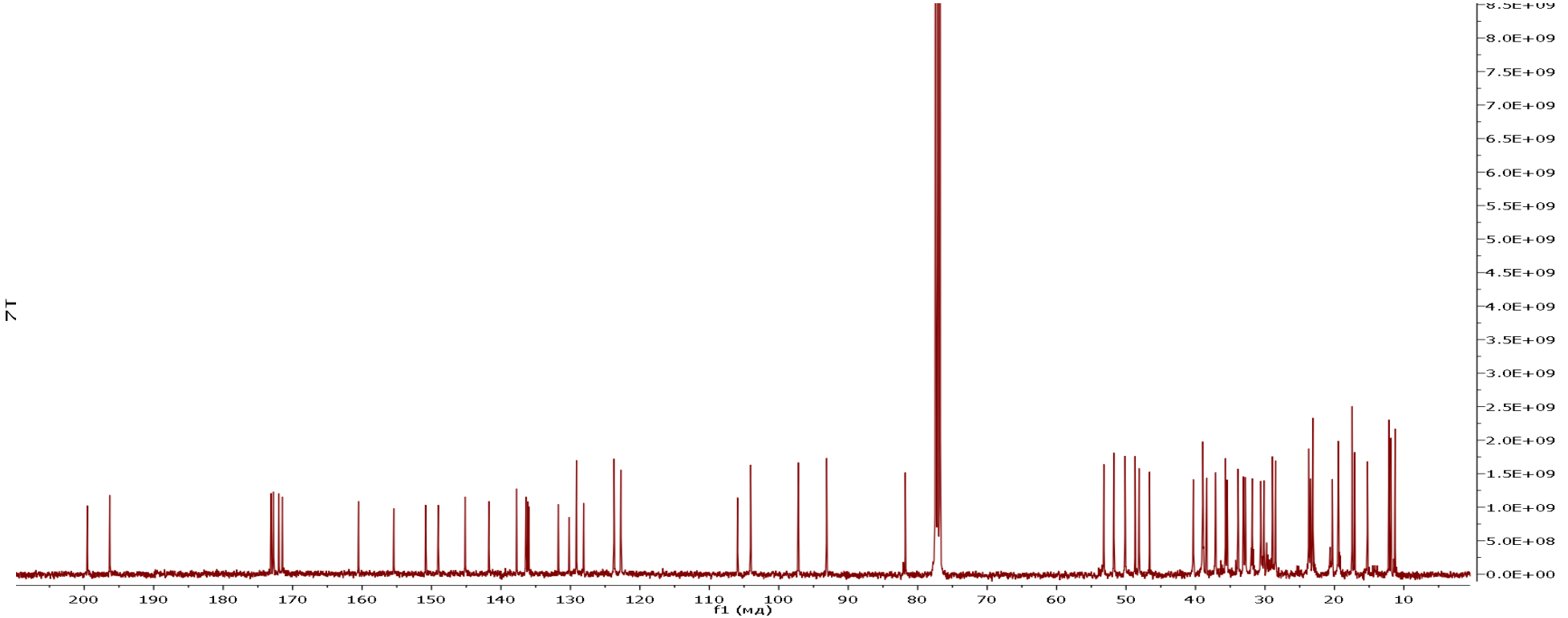
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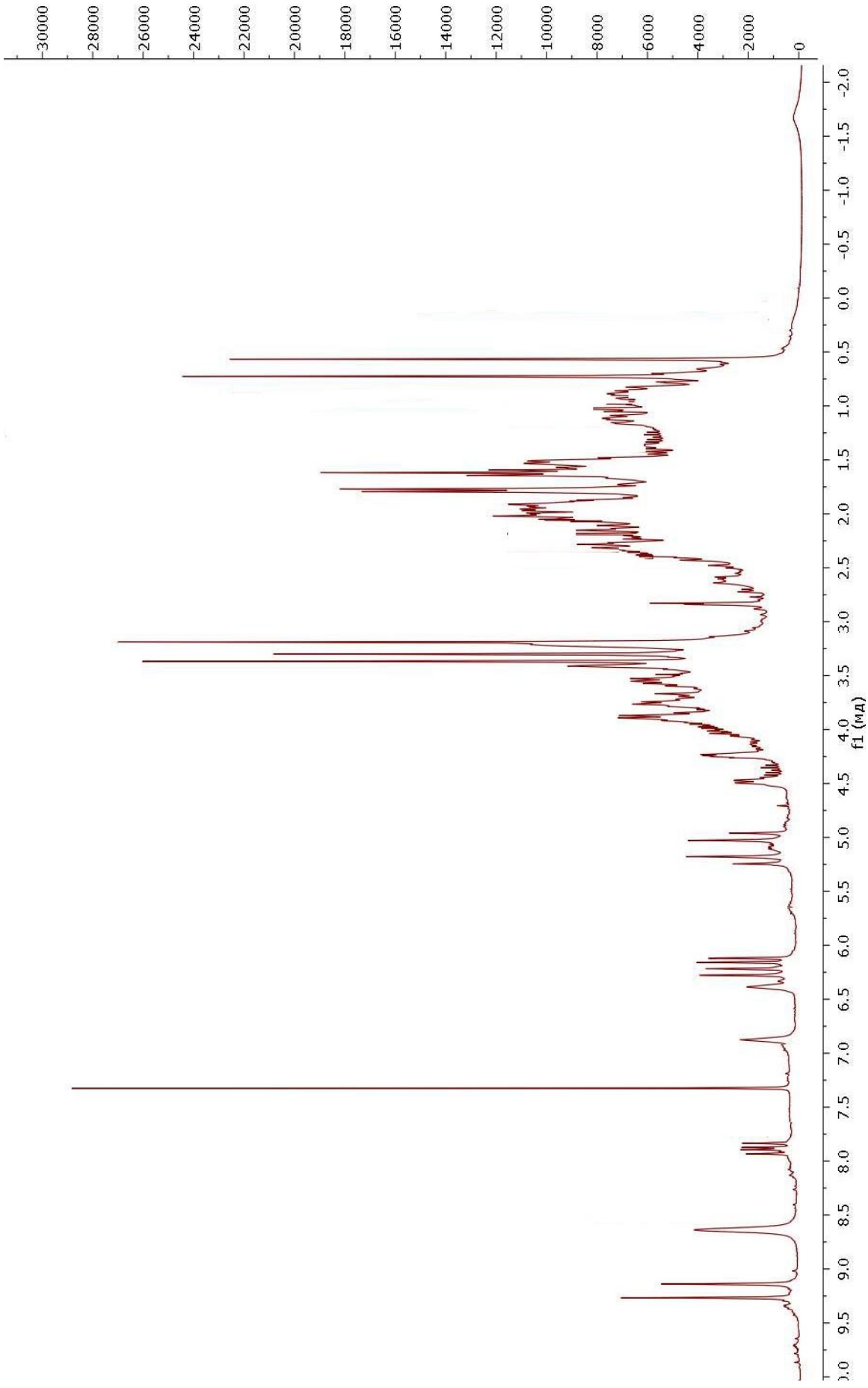
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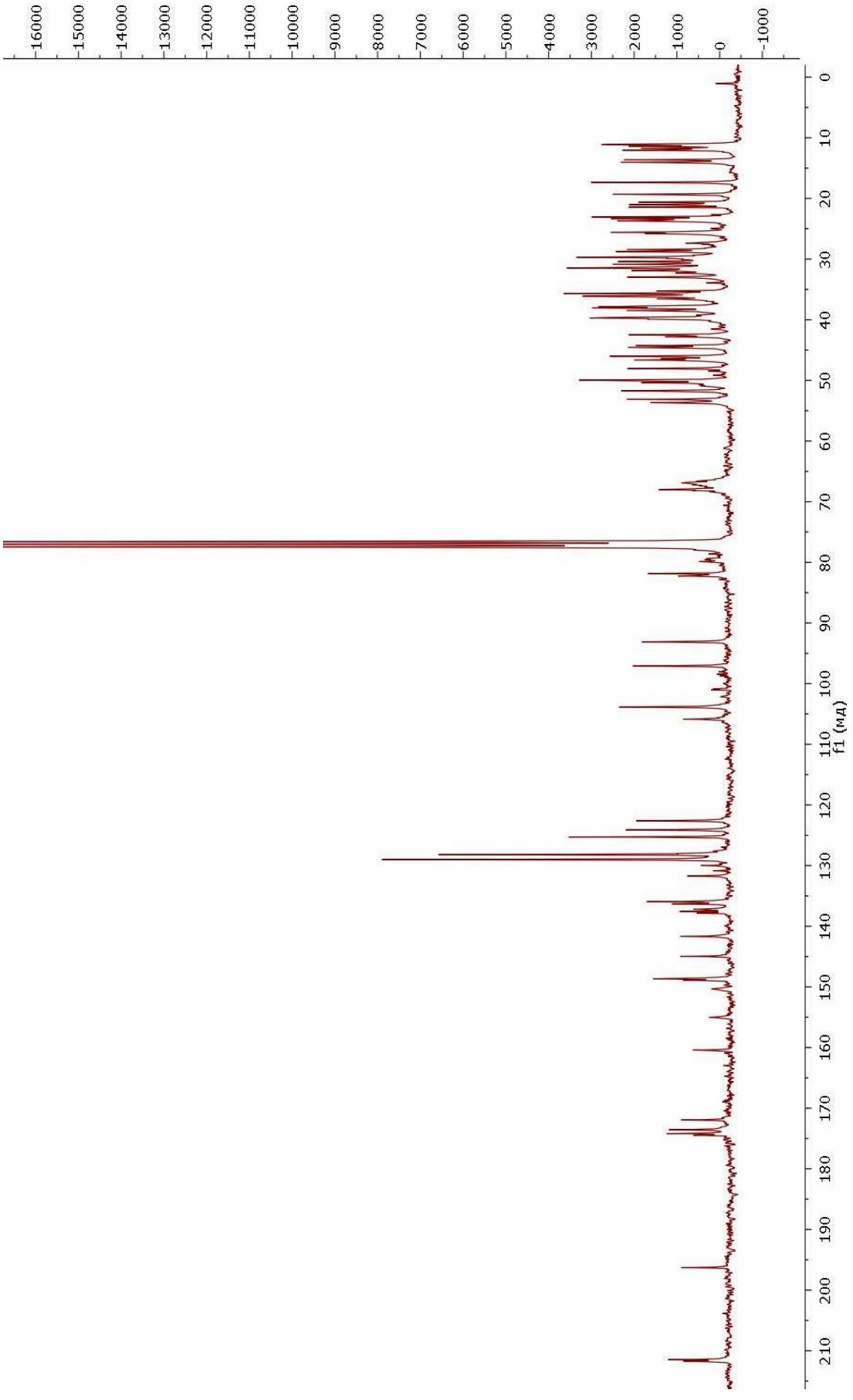
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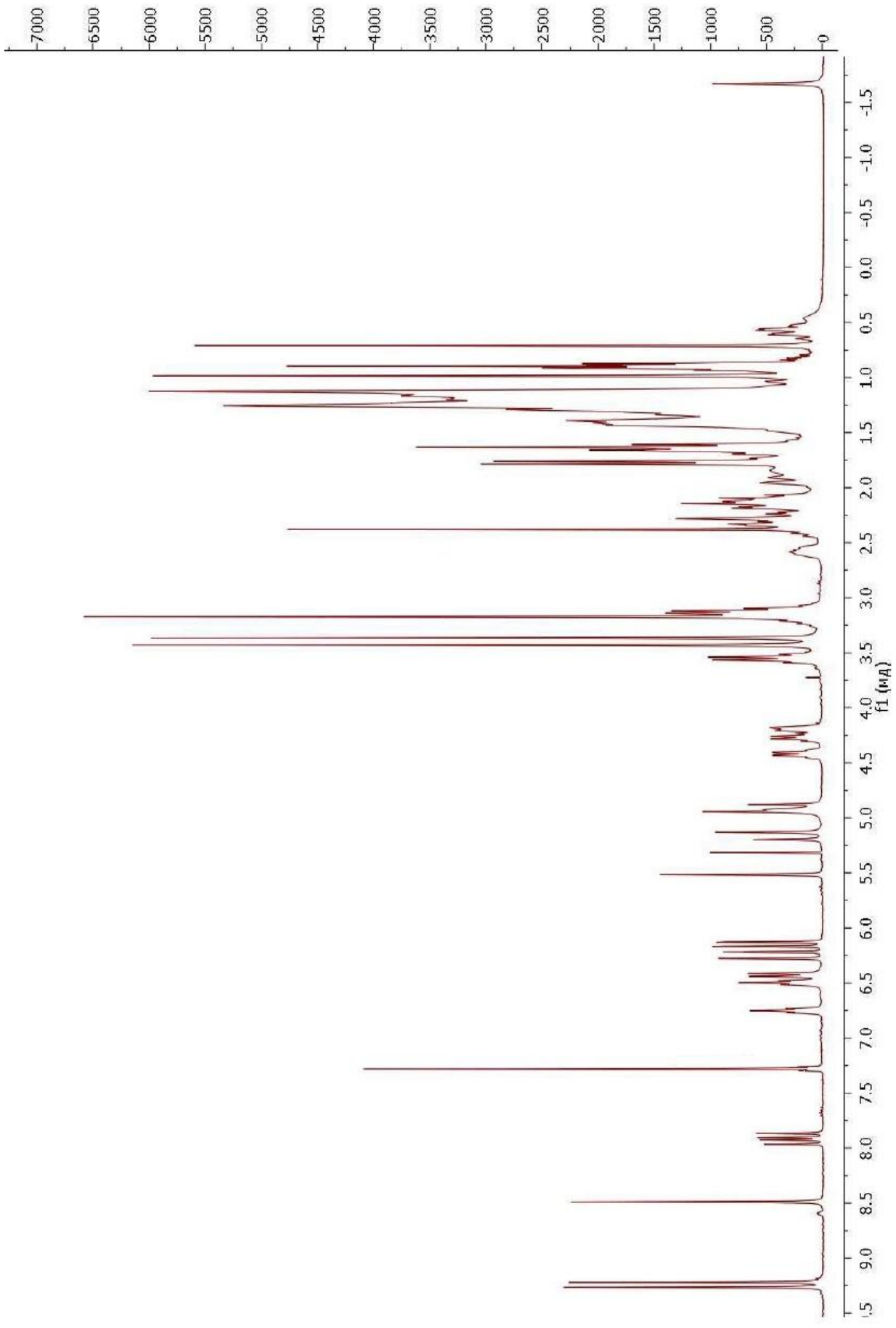
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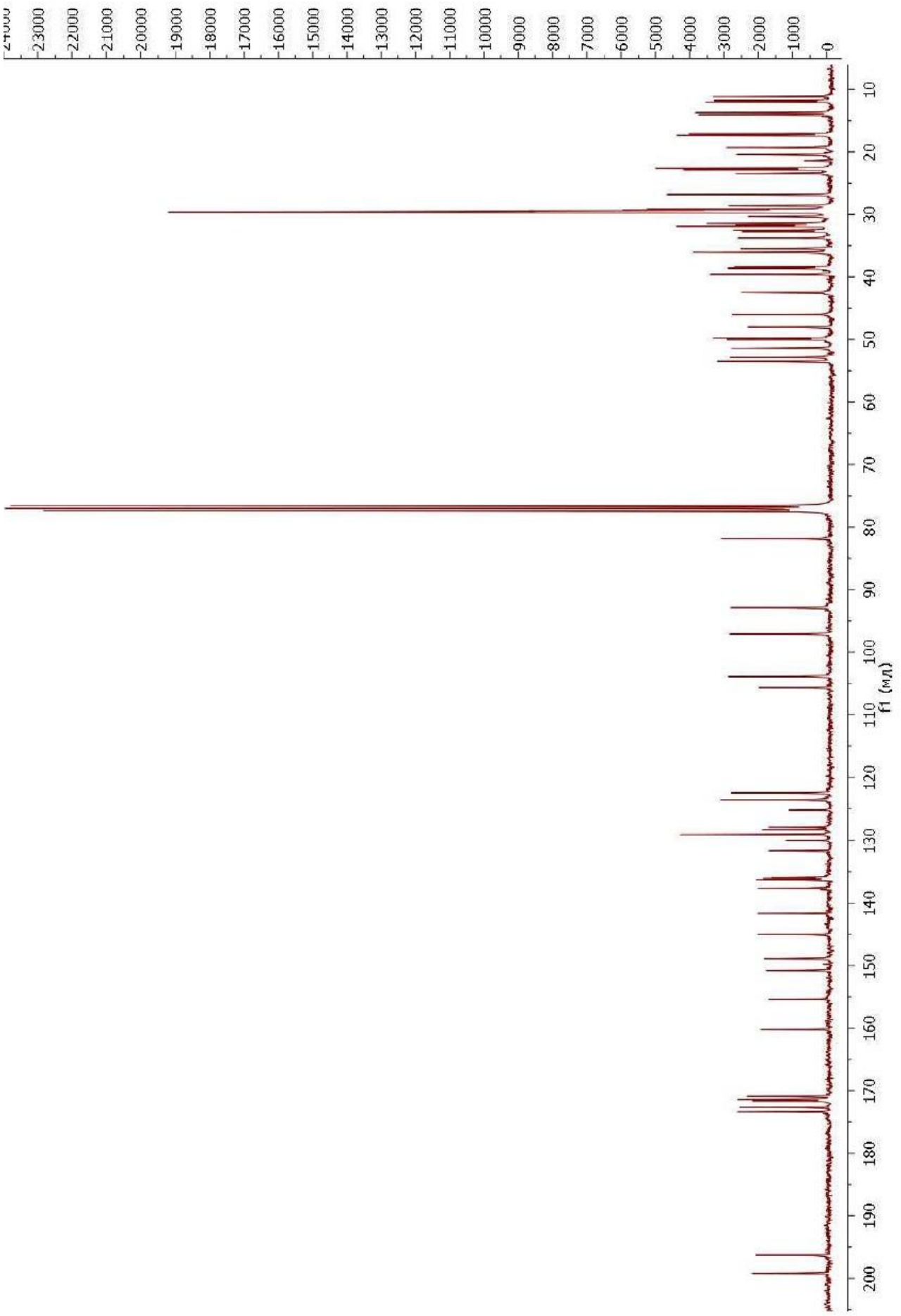
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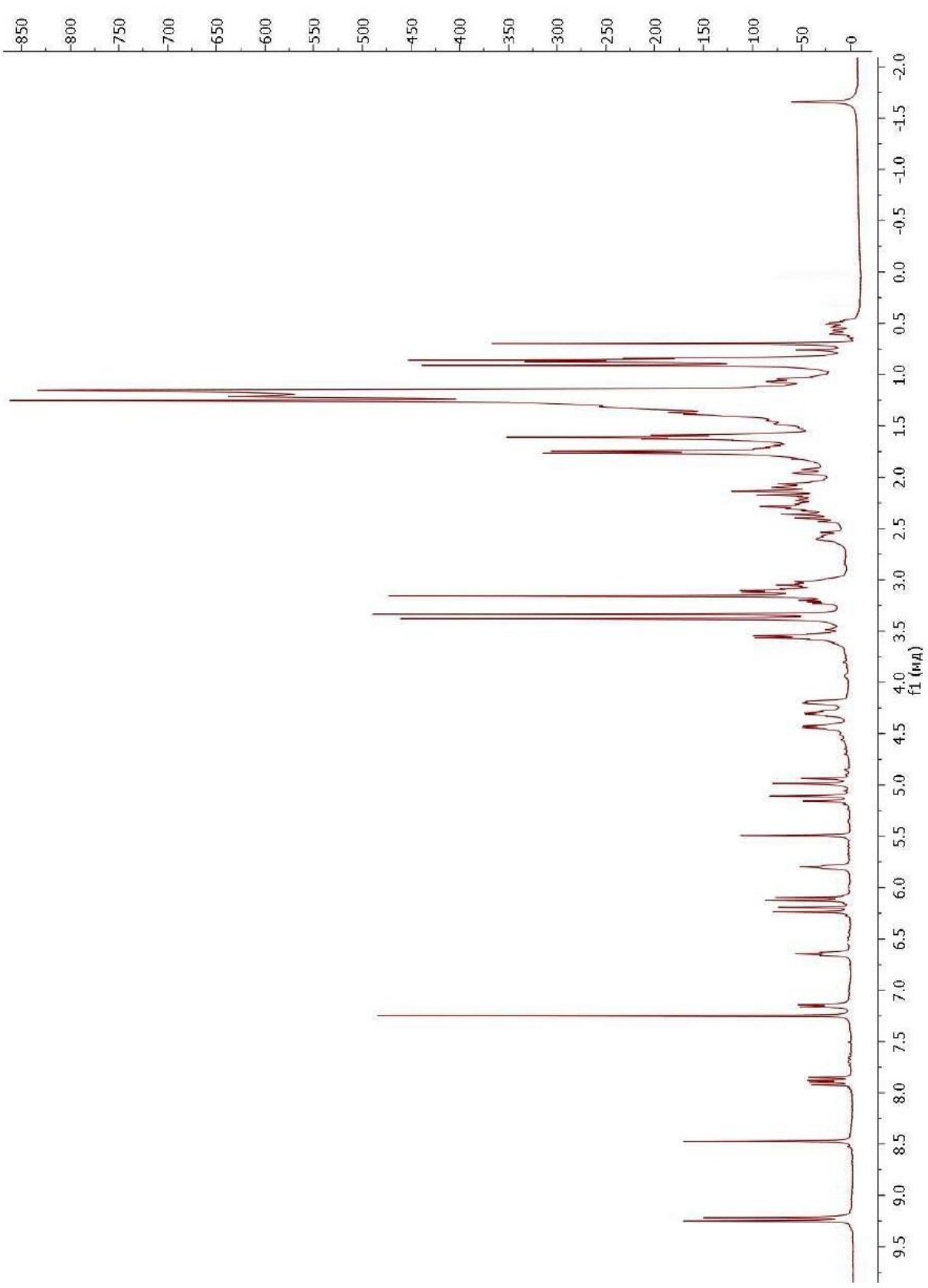
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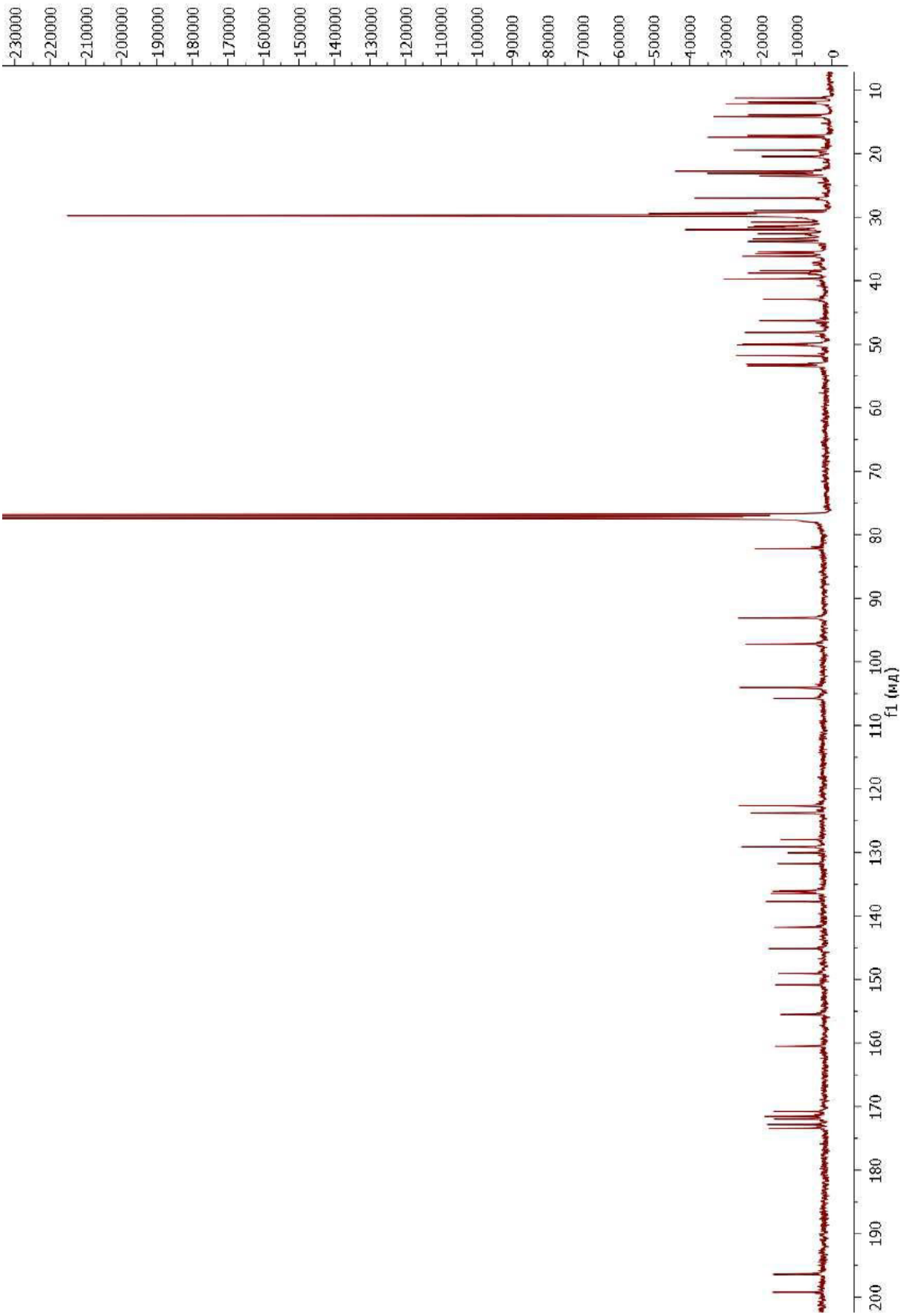
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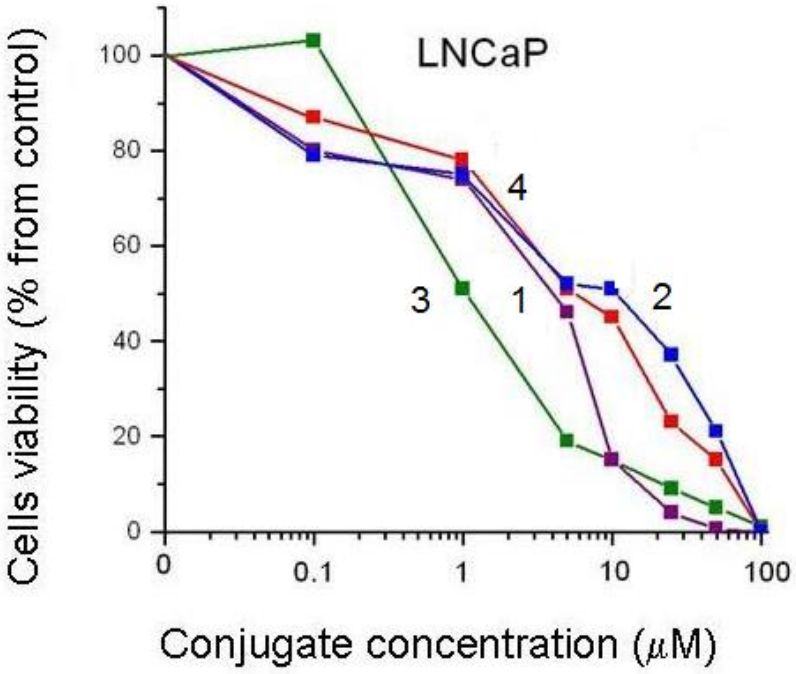

Fig. S-3a. Effects of conjugates **1 – 4** on LNCaP cells growth

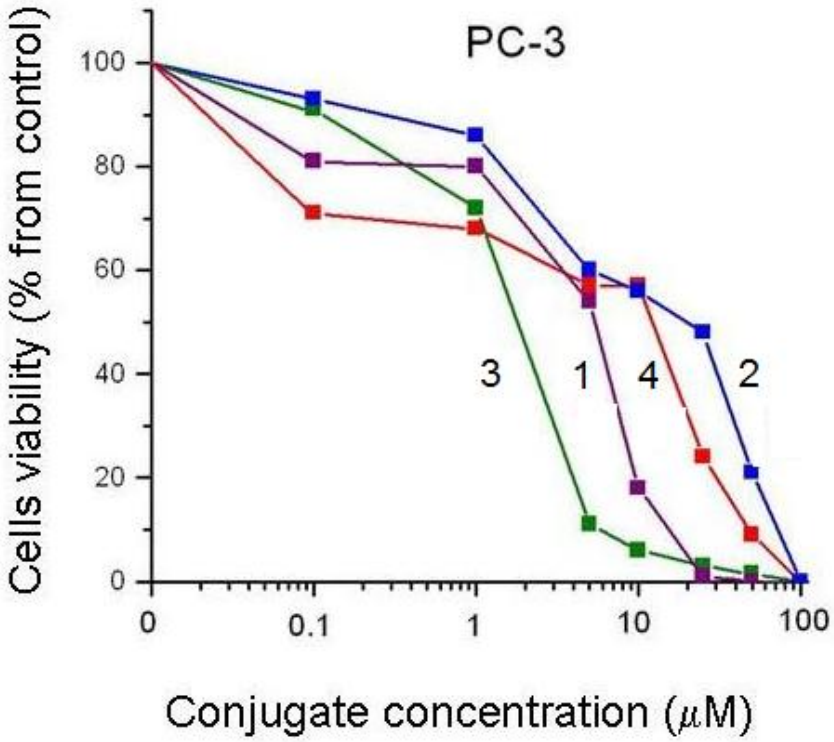

Fig. S-3b. Effects of conjugates **1 – 4** on PC-3 cells growth