

SYNTHESIS AND CHARACTERIZATION OF NEW ACYL-OXIMINES DERIVATIVES WITH POTENTIAL PHARMACOLOGICAL ACTIVITY

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Abstract

In our previous article we presented the synthesis and characterization of nine new acyl-oximines derivatives. We continued our research in order to synthesis new bioactive molecules with tricyclic structures which might become new compounds with pharmacological properties similar with the tricyclic antidepressants. These new substances are O-acyl-oximine derivatives with 10,11-dihydro-5H-dibenzo[a,d]cycloheptadienic and O-acyl-oximine derivatives with 5H-dibenzo[a,d]cycloheptatrienic structure. The structures of these new compounds were confirmed by elemental analysis, infrared and NMR spectra.

Rezumat

Într-un articol anterior [4] am prezentat sinteza și caracterizarea a nouă compuși acil-oximinici noi. Am continuat cercetările cu scopul de a sintetiza noi molecule biologice active din clasa compușilor triciclici cu potențială acțiune farmacologică similară antidepressivelor triciclice. Acești noi derivați sunt compuși din clasa O-acil-oximinelor cu structură 10,11-dihidro-5H-dibenzo[a,d]ciclo-heptadienică și 5H-dihidro-5H-dibenzo[a,d]cicloheptatrienică. Structurile noilor compuși au fost confirmate prin analiză elementală, spectre în infraroșu și spectre de rezonanță magnetică nucleară.

Keywords: oximes, oximines, acylation, dibenzocycloheptadienes, dibenzocycloheptatrienes, 5H-dibenzo[a,d]cycloheptene.

Introduction

Before the 1950s, opioids and amphetamines were commonly used as antidepressants. Their use was later restricted due to their addictive nature and side-effects [12]. Extracts from the herb Saint John's wort had been used as a "nerve tonic" to alleviate depression [20].

The antidepressant effect of a tricyclic derivative, a three ringed compound, was first discovered in early 1957s by Roland Kuhn in a Swiss psychiatric hospital. Antihistamine derivatives were used to treat surgical shock and later as neuroleptics. Although in 1955 reserpine was

shown to be more effective than placebo in alleviating anxious depression, neuroleptics were being developed as sedatives and antipsychotics [21].

Later on, several medicinal chemistry and pharmacological experimental research revealed the antidepressant effects of dibenzocycloheptadiene derivatives such as amitriptyline [1,14], nortriptyline [15], noxipryline [8] or doxepine [11]. As well as reducing depressive symptoms, these types of tricyclic derivatives also ease migraines, tension headaches, anxiety, attacks and some schizophrenic symptoms. They are also known to reduce aggression and violent behavior and they have a positive influence on eating disorders [5, 18].

Some of these tricyclic antidepressants are used for attention deficit hyperactivity disorders (ADHD) [23], bipolar disorders, insomnia, in the treatment of nocturnal enuresis (bedwetting) in children and as a preventive for patients with recurring biliary dyskinesia (sphincter of Oddi dysfunction) [3, 22]. As a therapy for irritable bowel syndrome, beside famotidine in the first-step therapy, the effect of antidepressants has been assessed as the second-step therapy [17]. Researchers have also shown that some tricyclic antidepressants like amitriptyline can reduce pain in peripheral neuropathy caused by cancer chemotherapy [25]. This therapeutic effect is similar to the effect produced by gabapentin or the combination between gabapentin and tramadol in the prophylaxis of paclitaxel-induced neuropathy [24]. Amitriptyline is also used in ankylosing spondylitis for pain relief [2] and in paresthesias related to multiple sclerosis [6].

These tricyclic antidepressants block the reuptake of norepinephrine and serotonin and in the same time they block the sodium channels, possibly accounting in part for their analgesic action [13].

Despite these important therapeutic effects, tricyclic antidepressants have side effects like drowsiness and dry mouth. Other common side effects of using tricyclic antidepressants are mostly caused by their anticholinergic activity, including: weight gain, changes in appetite, muscle stiffness, nausea, constipation, nervousness, dizziness, tremor, blurred vision, urinary retention, and changes in sexual function. Some rare side effects include seizures, tinnitus, hypotension, mania, psychosis, hypnagogic or hypnopompic hallucinations related to sleep paralysis, heart block, arrhythmias, lip and mouth ulcers, extrapyramidal symptoms and suicidal thoughts [10].

In order to continue our research in finding new bioactive molecules related to these tricyclic compounds and with less side effects we decided to synthesis some new O-acyl-oximine derivatives having a 5H-

dibenzo[a,d]cycloheptadiene or 5H-dibenzo[a,d]cycloheptatriene structure with antidepressant potential, analgesic or anti-inflammatory effects.

Materials and Methods

Melting points were measured in open capillary tubes on an Electrothermal 9100 apparatus and were uncorrected. Infrared spectra were recorded on a FT/IR – solid in ATR spectrometer. The NMR spectra were recorded on a Gemini 300BB instrument at room temperature, operating at 300 MHz for ^1H -NMR and 75 MHz for ^{13}C -NMR. The chemical shifts were reported in δ units (ppm) relative to residual peak of the deuterated solvent (CDCl_3 and DMSO-d_6). Tetramethylsilane (TMS) was used as internal standard. Elemental analysis was performed on a Perkin Elmer CHNS/O Analyser Series II 2400 apparatus and the results were in agreement with the calculated values.

All starting materials and solvents were purchased from common commercial suppliers and used without purification unless otherwise noted.

Intermediate synthesis

We decided to try the acylation reaction of some dibenzocycloheptaatomic oximes with some acid chlorides, thinking that the combined molecular structures will improve the biological action of the future substances.

The intermediate compounds were obtained using a condensation reaction. Dibenzosuberone (10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-one) (I) was condensed with hydroxylamine hydrochloride in order to obtain 5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene (III) and dibenzosuberone (5H-dibenzo[a,d]cyclohepten-5-one) (II) was also condensed with hydroxylamine hydrochloride to give 5-oximino-5H-dibenzo[a,d]cycloheptene (IV). The condensation reaction is presented in Figure 1.

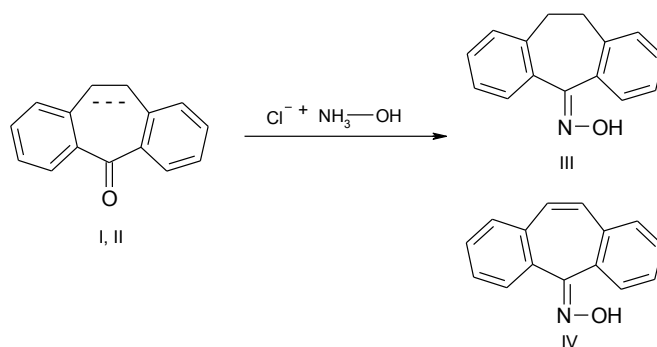


Figure 1

Synthesis of the intermediate compounds (III and IV)

In a round-bottom flask equipped with condenser, stirrer and dropping funnel were added 65mL methanol, 25g dibenzosuberone (0.12mol) and 28.75g of sodium hydroxide (0.718mol). The mixture was stirred until the complete dissolution of the compounds. A solution of 12.5g hydroxylamine (0.179mol) in 70mL methanol was drop wise added. The mixture was refluxed for 5 hours. After the mixture returned to room temperature we added a solution of 62mL concentrated hydrochloride acid and 137.5mL water. During this process we had to keep the temperature under 25°C. We obtained a precipitate which was filtered, washed with water and then dried at 70°C, resulting 24.5g of crude oxime (III). The compound was recrystallized from toluene (91.4% yield, m.p. 166-167°C) [7].

We obtained ketone IV following the same technique. We used 15g dibenzosuberone (0.072mol) and we obtained 14.4g of crude oxime (IV). The compound was recrystallized from toluene (90% yield, m.p. 184-185°C).

Final compounds synthesis

The acylation reaction parameters were tested by obtaining some original O-acyl-oximines. These oximines were obtained by treating the tricyclic oximes with substituted aromatic acid chlorides in anhydrous benzene and in the presence of anhydrous pyridine as a proton fixator [4, 9, 16, 19].

The new O-acyl-oximines were obtained in accordance with the following general procedure described in Figure 2:

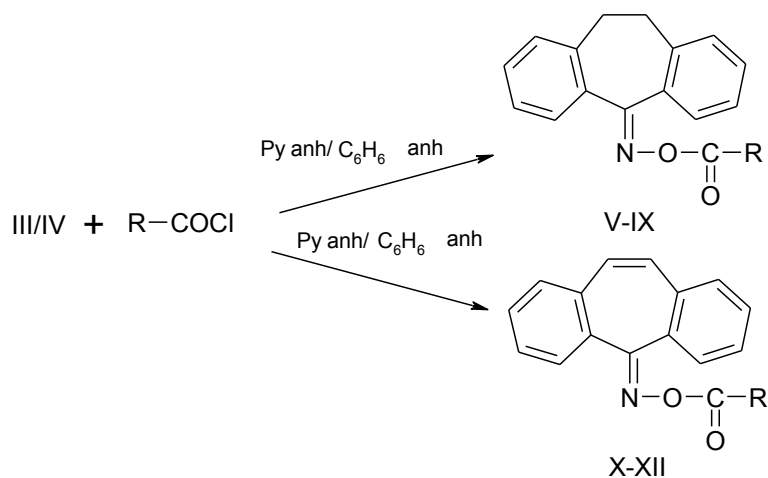
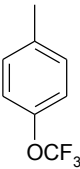
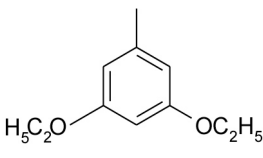
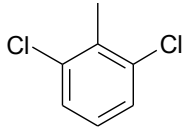
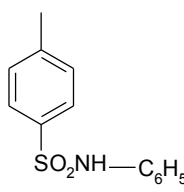
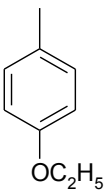
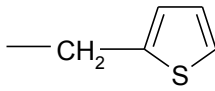
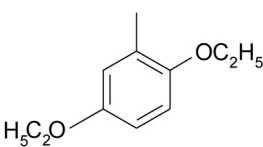
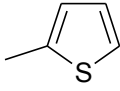


Figure 2

Synthesis of the new O-acyl-oximines (V-XII).

In Figure 2, R- is noted with Roman numbers from V to XII, which are in correspondence with the structures of the final compounds V to XII. The different radicals are presented in table I.

Table I
Radical R-

No	R	No	R
V		IX	
VI		X	
VII		XI	
VIII		XII	

An amount of 0.58g of 5-Oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene (0.0026mol) or 0.58g of 5-oximino-5H-dihydro[a,d]cycloheptene (0.0026mol) were dissolved in 15mL anhydrous benzene. There were gradually added 0.0026mol of each corresponding acid chlorides in 15mL anhydrous benzene and 0.21mL anhydrous pyridine (0.0026mol). A white precipitate (pyridinium hydrochloride) immediately

appeared. The reaction mixture was refluxed for 3 hours and then was filtered. The organic phase was evaporated to dryness at room temperature to give the final crude compound. The new acyl-oximines were recrystallized from isopropanol.

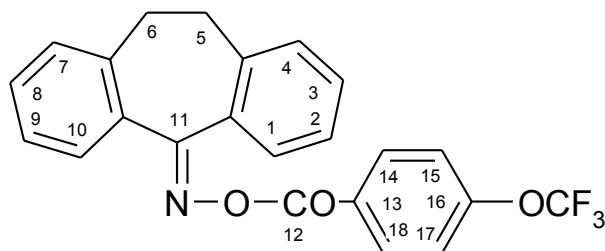
Results and Discussion

Following the acylation reaction between 5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene or 5-oximino-5H-dibenzo[a,d]cycloheptene and the different carboxylic acid chlorides, we obtained eight new acyl-oximines. We used anhydrous reaction conditions and anhydrous pyridine as a proton fixator. These new acyl-oximines are solid, crystalline, white compounds and they were recrystallized from isopropanol. Their structures were confirmed by elemental analysis, IR and NMR spectra. In the following are presented elemental composition, melting point (m.p.), reaction yield and spectral data for compounds V-XII.

The renumbering of atoms is the same for compounds V-IX, so there is no need to present the structures for all V-IX compounds. For compounds X-XII the carbon atoms are in different positions and it is necessary to give their renumbered structures.

Compound V O-(4-Trifluoromethoxy-benzoyl)-5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene

C₂₃H₁₆F₃NO₃: Calculated: C 67.15%, H 3.92%, N 3.40%; Found: C 67.36%, H 3.73%, N 3.63%; m.p. = 86-87°C; yield 61%;



¹H-NMR(CDCl₃, δ ppm, *J* Hz, T=298K): 7.90(d, 2H, H-14, H-18, 9.1); 7.80(dd, 1H, H-1, 1.2, 7.6); 7.40÷7.29(m, 4H, H-arom); 7.27(td, 1H, H-2, 7.6, 1.4); 7.21(dq, 2H, H-15, H-17, 9.1, ⁵*J*(3F- H^{15, 17})=1.1 Hz); 7.17(dd, 1H, H-4 or H-7, 1.1, 7.8); 7.42(dd, 1H, H-10, 1.7, 7.9); 3.21(bs, 4H, H-5, H-6).

¹³C-NMR(CDCl₃, δ ppm, T=298K): 167.73(C-11); 162.62(C-12); 152.77(q, C-16, ⁴*J*(3F-C¹⁶)=1.7 Hz); 139.23(C-4a); 138.03(C-7a); 133.97(C-1a); 132.67(C-10a); 131.71(C-14, C-18); 130.64(CH); 130.43(CH); 130.02(CH); 129.52(C-1); 128.49(CH); 127.50(CH); 127.17(C-13); 126.42(CH);

125.77(CH); 120.95(q, CF₃, $J(3F-C)=260.1$ Hz); 120.34(q, 2C, C-15, C-17, $^4J(3F-C^{15,17})=1.2$ Hz); 33.44(C-5 or C-6); 31.83(C-6 or C-5).

FT-IR(solid in ATR, ν cm⁻¹): 3056w; 2897w; 1744vs; 1606w; 1504w; 1484w; 1326w; 1251vs; 1206vs; 1152vs; 1073s; 1053m; 1015m; 981m; 917w; 860m; 774w; 760m; 746m; 707w; 691w.

Compound VI O-(2,3-Dicloro-benzoyl)-5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene

C₂₂H₁₅Cl₂NO₂: Calculated: C 66.68%, H 3.82%, N 3.53%; Found: C 66.98%, H 4.03%, N 3.24%; m.p. = 182-183°C; yield 70.5%;

¹H-NMR(CDCl₃, δ ppm, J Hz, T=298K): 7.74(dd, 1H, H-1, 1.4, 7.7); 7.40÷7.19(m, 11H, H-arom); 7.16(dd, 1H, H-4 or H-7, 1.4, 7.6); 3.19(bs, 4H, H-5, H-6).

¹³C-NMR(CDCl₃, δ ppm, T=298K): 168.81(C-11); 168.62(C-12); 139.27(C-4a); 137.75(C-7a); 133.63(C-1a); 132.59(C-10a); 132.35(C-14, C-18); 132.25(C-13); 131.15(CH); 130.64(CH); 130.43(CH); 129.94(CH); 129.34(C-1); 128.16(CH); 127.82(CH); 127.81(C-15, C-17); 126.37(CH); 125.94(CH); 33.37(C-5 or C-6); 31.69(C-6 or C-5).

FT-IR(solid in ATR, ν cm⁻¹): 3077w; 2965w; 2924w; 2893w; 2865w; 1752vs; 1592w; 1576w; 1562m; 1485w; 1431s; 1310m; 1239vs; 1196m; 1160w; 1122s; 1076m; 1038m; 971m; 865w; 842m; 800w; 777s; 764s; 751m; 732m; 689m; 638w.

Compound VII O-(4-Ethoxy-benzoyl)-5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene

C₂₄H₂₁NO₃: Calculated: C 77.61%, H 5.70%, N 3.77%; Found C 77.31%, H 5.95%, N 3.60%; m.p. = 143-144°C; yield 79.8%;

¹H-NMR(CDCl₃, δ ppm, J Hz, T=298K): 7.80(d, 2H, H-14, H-18, 9.1); 7.79(dd, 1H, H-1, 1.4, 7.7); 7.44(dd, 1H, H-10, 1.4, 7.9); 7.40÷7.22(m, 5H, H-arom); 7.15(dd, 1H, H-4 or H-7, 1.4, 7.4); 6.84(d, 2H, H-15, H-17, 9.1); 4.05(q, 2H, CH₂, 7.1); 3.20(bs, 4H, H-5, H-6); 1.41(t, 3H, CH₃, 7.1).

¹³C-NMR(CDCl₃, δ ppm, T=298K): 166.71(C-11); 163.60(C-12); 162.97(C-16); 139.14(C-4a); 138.01(C-7a); 134.18(C-1a); 133.05(C-10a); 120.74(C-13);

131.78(C-14, C-18); 130.50(CH); 130.20(CH); 129.77(CH); 129.59(C-1); 128.37(CH); 127.74(C-10); 126.35(CH); 125.69(CH); 114.17(C-15, C-17); 63.69(CH₂); 33.45(C-5 or C-6); 31.87(C-6 or C-5); 14.65(CH₃).

FT-IR(solid in ATR, ν cm⁻¹): 3044w; 2973w; 2932m; 2902m; 2883w; 2820w; 1741vs; 1605vs; 1511m; 1485w; 1440m; 1420m; 1400w; 1319s; 1249vs; 1167vs; 1046s; 1010m; 978s; 917m; 879m; 851s; 773w; 754s; 741s; 716m; 691m; 646m; 595m.

Compound VIII O-(2,5-Diethoxy-benzoyl)-5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene

C₂₆H₂₅NO₄: Calculated: C 75.16%, H 6.06%, N 3.37%; Found C 74.90%, H 5.83%, N 3.50%; m.p. = 127-128°C; yield 66.5%;

¹H-NMR(CDCl₃, δ ppm, *J* Hz, T=298K): 7.80(dd, 1H, H-1, 1.6, 7.7); 7.41(dd, 1H, H-10, 1.9, 7.8); 7.36÷7.20(m, 5H, H-arom); 7.16(dd, 1H, H-4 or H-7, 1.8, 7.7); 7.04(d, 1H, H-14, 3.0); 6.96(dd, 1H, H-16, 3.0, 9.0); 6.86(d, 1H, H-17, 9.0); 3.96(q, 2H, CH₂, 6.9); 3.84(q, 2H, CH₂, 7.1); 3.19(bs, 4H, H-5, H-6); 1.35(t, 3H, CH₃, 7.1); 1.31(t, 3H, CH₃, 6.9).

¹³C-NMR(CDCl₃, δ ppm, T=298K): 166.90(C-11); 163.28(C-12); 152.15(C-14); 152.26(C-17); 139.10(C-4a); 137.99(C-7a); 134.39(C-1a); 133.09(C-10a); 119.57(C-13); 130.50(CH); 130.17(CH); 129.59(C-1); 129.56(CH); 128.24(CH); 127.77(C-10); 126.33(CH); 125.67(CH); 121.03(C-16); 115.86(C-15); 115.64(C-18); 65.70(CH₂); 64.03(CH₂); 33.45(C-5 or C-6); 31.82(C-6 or C-5); 14.78(2CH₃).

FT-IR(solid in ATR, ν cm⁻¹): 3051w; 3017w; 2988m; 2961w; 2937w; 2888w; 1757vs; 1607w; 1592w; 1503m; 1473m; 1414m; 1395m; 1323w; 1308m; 1232s; 1199vs; 1137m; 1108m; 1043vs; 990m; 938m; 920m; 893w; 872m; 860m; 805m; 780m; 764m; 743m; 718w; 694w.

Compound IX O-(3,5-Diethoxy-benzoyl)-5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptene

C₂₆H₂₅NO₄: Calculated: C 75.16%, H 6.06%, N 3.37%; Found C 74.78%, H 6.24%, N 3.68%; m.p. = 133-134°C; yield 73.5%;

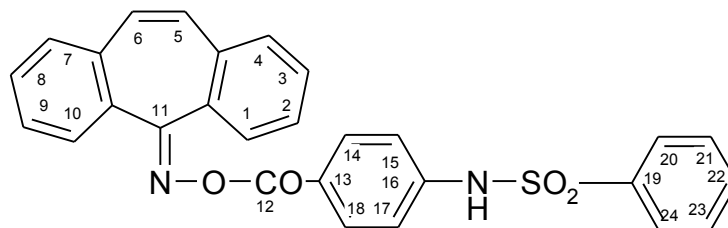
¹H-NMR(CDCl₃, δ ppm, *J* Hz, T=298K): 7.80(dd, 1H, H-1, 1.6, 7.7); 7.45(dd, 1H, H-10, 1.9, 8.0); 7.39÷7.23(m, 5H, H-arom); 7.16(dd, 1H, H-4 or H-7, 1.8, 7.7); 6.97(d, 2H, H-14, H-18, 2.5); 6.67(t, 1H, H-16, 2.5); 3.93(q, 2H, CH₂, 7.0); 3.21(bs, 4H, H-5, H-6); 1.37(t, 3H, CH₃, 7.0).

¹³C-NMR(CDCl₃, δ ppm, T=298K): 167.35(C-11); 163.56(C-12); 160.01(C-15, C-17); 139.33(C-4a); 138.24(C-7a); 134.44(C-1a); 132.87(C-10a); 130.51(C-13); 130.72(CH); 130.45(CH); 129.78(CH); 129.68(C-1); 128.55(CH); 127.81(CH); 126.52(CH); 125.72(CH); 107.66(C-16); 107.61(C-14, C-18); 63.86(2CH₂); 33.62(C-5 or C-6); 31.98(C-6 or C-5); 14.82(2CH₃).

FT-IR(solid in ATR, ν cm⁻¹): 3066w; 2974m; 2931m; 2876m; 1754vs; 1605vs; 1441s; 1418w; 1391m; 1365w; 1320vs; 1256m; 1195vs; 1165vs; 1112m; 1093s; 1056s; 1041m; 947s; 901m; 880m; 852m; 818w; 770w; 746s; 713w; 690w; 670w.

Compound X O-(4-Phenylsulfonamido-benzoyl)-5-oximino-5H-dibenzo-[a,d]cycloheptene

$C_{28}H_{20}N_2O_4S$: Calculated: C 69.99%, H 4.20%, N 5.83%; Found C 70.27%, H 3.98%, N 5.65%; m.p. = 222-223°C; yield 70.5%;



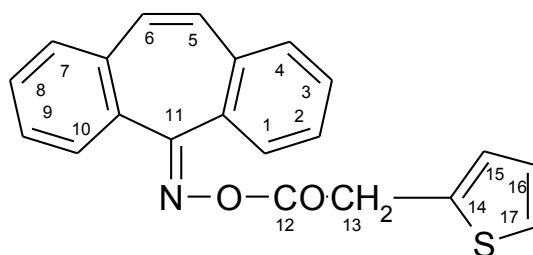
1H -NMR($CDCl_3$, δ ppm, J Hz, $T=298K$): 7.82(dd, 2H, H-20, H-24, 8.1, 1.5); 7.79(m, 1H, H-1); 7.72(d, 2H, H-14, H-18, 8.8); 7.63(m, 1H, H-10); 7.58÷7.38(m, 7H, H-arom); 7.43(t, 2H, H-21, H-23, 8.1); 7.09(d, 2H, H-15, H-17, 8.8); 6.98(d, 1H, H-5 or H-6, syst. AB, 13.5); 6.94(d, 1H, H-5 or H-6, syst. AB, 13.5).

^{13}C -NMR($CDCl_3$, δ ppm, $T=298K$): 164.18(C-11); 163.02(C-12); 141.21(C-16); 141.19(C-19); 138.81(Cq); 134.33(Cq); 130.05(Cq); 124.64(Cq); 110.01(C-13); 133.46(CH); 131.28(C-14, C-18); 130.89(C-6 or C-5); 130.10(C-5 or C-6); 129.71(CH); 129.53(CH); 129.37(CH); 129.27(CH); 128.99(CH); 129.20(CH); 128.44(C-10); 128.29(C-1); 127.65(CH); 127.14(C-20, C-24); 119.14(C-15, C-17).

FT-IR(solid in ATR, ν cm^{-1}): 3231m; 3066w; 2963w; 1708vs; 1603s; 1509m; 1469w; 1446w; 1402m; 1336s; 1300m; 1261vs; 1234m; 1164s; 1078s; 1015m; 976m; 904m; 882w; 862m; 843m; 801m; 758m; 716m; 682m; 643w.

Compound XI O-(2-Thienyl-acetyl)-5-oximino-5H-dibenzo[a,d]-cycloheptene

$C_{21}H_{15}NO_2S$: Calculated: C 73.02%, H 4.38%, N 4.06%; Found C 73.31%, H 4.14%, N 4.30%; m.p. = 143-144°C; yield 78.5%;



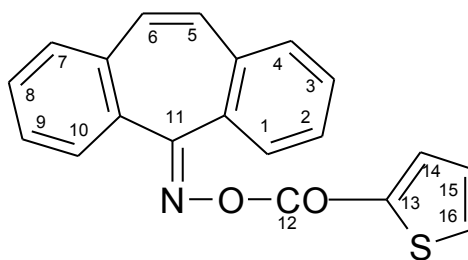
$^1\text{H-NMR}$ (CDCl_3 , δ ppm, J Hz, $T=298\text{K}$): 7.72(dd, 1H, H-1, 1.7, 7.7); 7.47÷7.32(m, 7H, H-2, H-3, H-4, H-7, H-8, H-9, H-10); 7.20(dd, 1H, H-17, $J(\text{H}^{17}-\text{H}^{15})=1.3$ Hz, $J(\text{H}^{17}-\text{H}^{16})=5.1$ Hz); 6.94(dd, 1H, H-16, $J(\text{H}^{16}-\text{H}^{15})=3.6$ Hz, $J(\text{H}^{16}-\text{H}^{17})=5.1$ Hz); 6.94(s, 2H, H-5, H-6); 6.87(m, 1H, H-15, $^3J(\text{H}^{16}-\text{H}^{15})=3.6$ Hz); 3.89(d, 1H, H-12'A, syst. AB, 16.3); 3.83(d, 1H, H-12'A, syst. AB, 16.3).

$^{13}\text{C-NMR}$ (CDCl_3 , δ ppm, $T=298\text{K}$): 167.60(C-11); 164.17(C-12); 134.30(Cq); 134.01(Cq); 131.34(Cq); 133.19(Cq); 130.62(CH); 130.20(CH); 129.66(CH); 129.27(CH); 129.13(CH); 128.91(C-5, C-6); 128.46(CH); 128.22(C-1); 127.83(CH); 127.21(C-15); 126.90(C-16); 125.13(C-17); 34.35(C-13).

FT-IR(solid in ATR, ν cm^{-1}): 3098w; 3062w; 2980w; 2913w; 1769vs; 1600w; 1586w; 1486w; 1443w; 1414w; 1397w; 1336m; 1110vs; 1039w; 994w; 922m; 898m; 875m; 848w; 805m; 779m; 739w; 726w; 703m; 690m; 637w.

Compound XII O-(2-Tenoyl)-5-oximino-5H-dibenzo[a,d]cycloheptene

$\text{C}_{20}\text{H}_{13}\text{NO}_2\text{S}$: Calculated: C 72.49%, H 3.95%, N 4.23%; Found C 72.25%, H 4.23%, N 4.02%; m.p. = 138-139°C; yield 60.5%;



$^1\text{H-NMR}$ (CDCl_3 , δ ppm, J Hz, $T=298\text{K}$): 7.82(m, 1H, H-1); 7.71(dd, 1H, H-16, 1.1, 3.6); 7.68(m, 1H, H-10); 7.56(dd, 1H, H-14, 1.1, 5.0); 7.53÷7.40(m, 6H, H-arom); 7.07(dd, 1H, H-15, 3.6, 5.0); 6.99(d, 1H, H-5 or H-6, syst. AB, 12.6); 6.95(d, 1H, H-5 or H-6, syst. AB, 12.6).

$^{13}\text{C-NMR}$ (CDCl_3 , δ ppm, $T=298\text{K}$): 164.02(C-11); 159.36(C-12); 134.40(Cq); 133.41(Cq); 133.40(C-13); 131.48(Cq); 130.00(Cq); 134.19(C-16); 133.41(C-14); 130.78(CH); 130.22(CH); 129.71(CH); 129.43(CH); 129.29(CH); 128.98(C-5 or C-6); 128.96(C-5 or C-6); 128.80(C-10); 128.38(C-1); 127.83(C-15); 127.65(CH).

FT-IR(solid in ATR, ν cm^{-1}): 3104w; 3087w; 3017w; 1737vs; 1588m; 1519m; 1489w; 1412s; 1356m; 1331m; 1253s; 1237s; 1204s; 1174m; 1159m; 1081m; 1062s; 1025s; 968s; 898w; 874m; 858m; 800m; 772s; 734m; 717s; 637w.

Conclusions

We have synthesized a series of new acyl-oximines with therapeutic potential. We obtained five new compounds in the dibenzocycloheptadienic series and three new compounds in the dibenzocycloheptatrienic series. We followed an acylation reaction between 5-oximino-10,11-dihydro-5H-dibenzo[a,d]cycloheptadiene or 5-oximino-5H-dibenzo[a,d]cycloheptatriene and the different carboxylic acid chlorides. The structures of these eight new acyl-oximines have been confirmed by elemental analysis and spectrometric methods (IR, $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$).

Acknowledgements

This work was supported by FEST („*Finanțare Europeană pentru Studii Doctorale*”), project number POSDRU/88/1.5/S/64331.

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Manuscript received: November 22nd 2012