

these compounds under the conditions of mass spectral analysis. In order to obtain the derivatives **5** it was necessary to use an inert reaction atmosphere and to avoid acidic catalysis in all stages during the synthesis and isolation.

Thus, the present work has demonstrated the possibility of annelation of the 2-acylcyclohexane-1,3-diones with a modified ring carbonyl group with Schiff bases. This provides a simple, one-step synthesis of 8-azasteroid derivatives with a modified carbonyl group at the pharmacologically significant C(17a) position.

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References

- 1 A. A. Akhrem and Yu. A. Titov, *Total Steroid Synthesis*, Plenum Press, New York, 1970, p. 362.
- 2 (a) A. A. Akhrem, B. B. Kuz'mitsky, F. A. Lakhvich, V. A. Khripach and Yu. L. Zhuravkov, *Khimiya i biologiya bioregulyatorov (Chemistry and Biology of Immunoregulators)*, Zinatne, Riga, 1985, p. 265 (in Russian); (b) B. B. Kuz'mitsky, I. G. Dad'kov, Yu. L. Zhuravkov, N. A. Konoplya, G. A. Shafranskaya, O. V. Gulyakevich, V. N. Pshenichny and V. A. Khripach, *Vesti Akad. Nauk BSSR, Ser. Biol. Nauk*, 1987, 79 (in Russian); (c) B. B. Kuz'mitsky, I. G. Dad'kov, Yu. L. Zhuravkov, N. A. Konoplya, G. S. Lyubin, A. E. Mashkovich, V. M. Nasek, O. V. Gulyakevich, V. N. Pshenichny and V. A. Khripach, *Vesti Akad. Nauk BSSR, Ser. Khim. Nauk*, 1989, 64 (in Russian); (d) N. A. Konoplya, O. V. Gulyakevich, A. L. Mikhal'chuk and B. B. Kuz'mitsky, *Vesti Akad. Nauk BSSR, Ser. Khim. Nauk*, 1994, 91 (in Russian).
- 3 (a) A. L. Mikhal'chuk, O. V. Gulyakevich and A. A. Akhrem, *Zh. Obshch. Khim.*, 1993, **63**, 1917 (*Russ. J. Gen. Chem.*, 1993, **63**, 1338); (b) O. V. Gulyakevich, A. L. Mikhal'chuk and A. A. Akhrem, *Khim. Geterotsikl. Soedin.*, 1995, 187 [*Chem. Heterocycl. Compd. (Engl. Transl.)*, 1995, 160]; (c) O. V. Gulyakevich, A. S. Lyakhov and A. L. Mikhal'chuk, *Dokl. Ross. Akad. Nauk*, 1996, **349** (2), 202 [*Dokl. Chem. (Engl. Transl.)*, 1996, 172].
- 4 M. von Strandtmann, M. P. Cohen and John Shavel, Jr., *J. Org. Chem.*, 1966, **31**, 797.
- 5 (a) A. L. Mikhal'chuk, O. V. Gulyakevich, A. A. Zenyuk, A. V. Korchik, L. G. Lis, V. A. Khripach and L. I. Ukhova, *Dokl. Akad. Nauk SSSR*, 1991, **317**, 1397 [*Dokl. Chem. (Engl. Transl.)*, 1991, 106]; (b) A. L. Mikhal'chuk, O. V. Gulyakevich, A. A. Zenyuk, Yu. V. Shklyayev, V. S. Shklyayev and A. A. Akhrem, *Zh. Obshch. Khim.*, 1993, **63**, 1891 (*Russ. J. Gen. Chem.*, 1993, **63**, 1319); (c) A. L. Mikhal'chuk, O. V. Gulyakevich, D. B. Rubinov and A. A. Akhrem, *Khim. Geterotsikl. Soedin.*, 1993, 374 [*Chem. Heterocycl. Compd. (Engl. Transl.)*, 1993, 313]; (d) O. V. Gulyakevich, A. L. Mikhal'chuk and A. A. Akhrem, *Zh. Obshch. Khim.*, 1994, **64**, 1544 (*Russ. J. Gen. Chem.*, 1994, **64**, 1382).
- 6 O. V. Gulyakevich, A. L. Mikhal'chuk and V. A. Khripach, *Zh. Org. Khim.*, 1991, **27**, 213 [*J. Org. Chem. USSR (Engl. Transl.)*, 1991, **27**, 187].
- 7 F. A. Lakhvich, L. G. Lis, D. B. Rubinov, I. L. Rubinova, V. Z. Kurbako and A. I. Bykhovets, *Vesti Akad. Nauk BSSR, Ser. Khim. Nauk*, 1989, 51 (in Russian).
- 8 (a) H. Smith, *J. Chem. Soc.*, 1953, 803; (b) M. V. Ablovatskaya, E. Yu. Gudriniece and A. Ya. Strakov, *Izv. Akad. Nauk Latv. SSR, Ser. Khim.*, 1989, 601 (in Russian).

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