OXIDATION OF INDOLES WITH MOLYBDENUMPEROXO COMPLEX, $MoO_5 \cdot HMPA$

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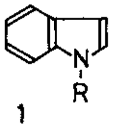
The oxidation of indoles with peracids proceeds via the formation of the 2,3-epoxy intermediates, which undergoes the nucleophilic ring opening by peracids. This observation prompted us to investigate the oxidation of indoles with the presumably non-nucleophilic epoxidizing agent, (hexamethylphosphoramide)oxodiperoxomolybdenum (VI), $MoO_5 \cdot HMPA$. We wish to describe the oxidation of indoles with $MoO_5 \cdot HMPA$ to give 2-hydroxyindoxyl, isatogen, and 2,3-dihydroxyindoline derivatives.

Oxidation of 1-acetylindoles, 1a and 2, with $MoO_5 \cdot HMPA$ in CH_2Cl_2 gave the corresponding 2-hydroxyindoxyls 3. 3a was also derived from indoxyl 4a by the treatment with $MoO_5 \cdot HMPA$.

Oxidation of 2-phenylindole (5) with $MoO_5 \cdot HMPA$ afforded a dimeric product 6, while treatment of 5 with 3 mole equiv. of $MoO_5 \cdot HMPA$ gave isatogen 7.

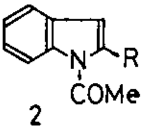
In methanol, oxidation of 1 with $MoO_5 \cdot HMPA$ gave 3-hydroxy-2-methoxyindolines 8, which were treated with $SnCl_4$ to give 1-acylindoxyls 4.

The oxidation of other indoles with $MoO_5 \cdot HMPA$ is also described, and the mechanism for these oxidation is discussed.



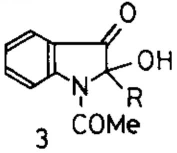
1

a) R=-COMe
b) R=-COPh
c) $R=-CO_2Me$
d) $R=-SO_2C_6H_4Me$



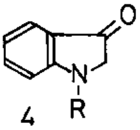
2

a) R=Me
b) R=Ph



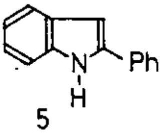
3

a) R=H
b) R=Me
c) R=Ph



4

a) R=-COMe
b) R=-COPh
c) $R=-CO_2Me$



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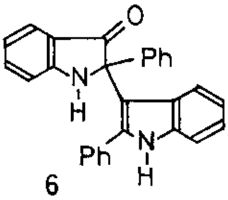

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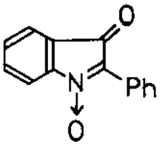

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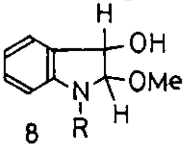

8

a) R=-COMe
b) R=-COPh
c) $R=-CO_2Me$
d) $R=-SO_2C_6H_4Me$