

## Interaction of methylpheophorbide *d* with butylamine and piperidine

© Ekaterina I. Pushkareva, and Dmitry V. Belykh\*<sup>+</sup>

*Institute of Chemistry, Komi Scientific Centre of Ural Division of Russian Academy of Sciences, Pervomaiskaya St., 48, Syktyvkar, 167982, Russia. Phone/fax: +7 (8212) 21-84-77. E-mail: belykh-dv@mail.ru*

\*Supervising author; <sup>+</sup>Corresponding author

**Keywords:** methylpheophorbide *a*, methylpheophorbide *d*, Schiff base, methylpheophorbide *a* 13-amide, opening of exocycle.

### Abstract

The interest in studying of chlorophyll *a* its derivatives peripheral substituents reactions due to the use of these reactions for the biologically active substances and model compounds synthesis. The interaction of methylpheophorbide *a* and its analogues and with amines is interesting from the viewpoint of chemical modifications of these compounds. Previously, we have shown that, in the reaction of the amine with methylpheophorbide *a* amidation of exocycle ester group as well as exocycle opening to form corresponding chlorin *e*<sub>6</sub> derivatives can occurs and it depends on the amine structure and reaction conditions. Both directions can be realized in case of sterically unhindered amines and to influence on the reaction the conditions changing can be used: at low temperatures and large excesses of the amine exocycle opening occurs and while reaction holding in toluene under reflux of the reaction mixture exocycle ester group amidation occurs. It is known from the literature that methylpheophorbide analogs with formyl group in the macrocycle, such as methylpheophorbide *d*, exhibit greater exocycle reactivity in the recovering under the action of amines reaction. At the same time, it remains unclear whether it is possible to change the direction of interaction methylpheophorbide *d* with amines when the reaction conditions changing. Thus in the present study we investigated the interaction of methylpheophorbide *d* with butylamine and piperidine in toluene under refluxing of the reaction mixture. It was shown that the result of the reaction of butylamine and piperidine with methylpheophorbide *d*, as well as in case of methylpheophorbide *a*, depends on the reaction conditions. It is found that the reaction of butylamine and piperidine with methylpheophorbide *d* in toluene under refluxing of the reaction mixture the exocycle ester group amidation occurs instead of the previously described exocycle opening. In case of butylamine Schiff base formation with the formyl group in position 3 occurs in addition to ester group amidation reaction.

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